

SPATIAL ALLOCATION PRACTICES OF FEDERALLY SUBSIDIZED
HOUSING PROGRAMS IN JACKSONVILLE, FLORIDA

By

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Abstract of Dissertation Presented to the Graduate Council
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I.

SPATIAL ALLOCATION PRACTICES OF FEDERALLY SUBSIDIZED
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By

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The housing subsidy received by a subsidized household is divided into its aspatial and spatial components, the housing structure subsidy and the locational subsidy. Various combinations of the locational and housing structure subsidies yield different housing subsidy levels. Socioeconomic scores are developed to measure the relative socioeconomic suitability of census tracts in Jacksonville, Florida. The socioeconomic score of a census tract is used as a surrogate measure of the locational subsidy provided to a subsidized household located in the census tract. Higher scores are assumed to yield higher locational subsidies. Increasing socioeconomic scores are also assumed to indicate a greater ability on the part of nonsubsidized households in a census tract to absorb the social costs which may be generated by the introduction of low income households.

Two aspects of the spatial allocation of federally subsidized housing programs are investigated. The value judgments guiding the

investigation assume maximization of locational subsidies and equal racial treatment for both subsidized and nonsubsidized households as goals. First, various housing programs are compared as to the absolute and relative locational subsidies achieved. Second, subsidized white and minority households within each housing program are compared as to the respective locational subsidies they receive. The seven housing programs investigated are located in census tracts affording significantly different locational subsidies. Subsidized white households within each housing program are consistently located in census tracts providing significantly higher locational subsidies than subsidized minority households. White households are also more likely to occupy those housing programs providing higher locational subsidies. Since housing structure subsidies are assumed to be identical, it is concluded that white households receive higher housing subsidies than minority households in both the five supply-side housing programs and the one demand-side housing program considered. These findings suggest that the current spatial allocation of subsidized housing units in Jacksonville is in violation of the federal government's responsibility of insuring equal racial treatment in the operation of federal housing programs.

Subsidized minority households receive considerably higher locational and housing subsidies when they are located in white dominated as opposed to black dominated census tracts. Despite this fact, census tracts occupied by nonsubsidized minority households are more likely to have subsidized housing units located in them. This indicates that addressing the spatial disadvantages experienced by both subsidized and nonsubsidized minority households necessarily involves a greater degree

of residential integration. This will involve the placement of a greater proportion of future subsidized units in white dominated census tracts with higher socioeconomic scores which will lead to a more equitable sharing of the social costs generated by the location of subsidized households.

A proposed housing allocation strategy aimed at addressing the identified problems is presented. The strategy attempts to maximize the locational and housing subsidies provided to subsidized households, minimize the racial-locational socioeconomic inequality, and provide a more equitable sharing of the social costs by nonsubsidized households.

CHAPTER I

A DECENT HOME AND A SUITABLE LIVING ENVIRONMENT: THE NEED FOR RESEARCH OF FEDERAL HOUSING PROGRAMS

"A decent home and suitable living environment for every American family" is a commonly quoted goal of federal housing programs. First proclaimed in the Housing Act of 1949 (42 USC 1441), this goal has been reaffirmed in the subsequent Housing Act of 1968 (12 USC 1701t) and the Housing and Community Development Act of 1974 (42 USC 5301). There are, in fact, two goals contained in the statement. The concept of a "decent home" has since been explicitly defined and, therefore, has received considerable attention. Federal housing programs will not, for example, subsidize households to live in housing units with structural deficiencies or lacking plumbing facilities deemed necessary for a "decent home." Unfortunately, "the suitable living environment" has not been defined even implicitly and appears to have escaped sufficient attention. In addition to these two important housing goals, the federal government has assumed the additional responsibility of insuring against racial discrimination in the operation of federal housing programs. This responsibility requires the federal government to design programs in which white and minority low income households receive comparable "decent homes" and similar "suitable living environments" through the implementation of federal housing programs at the local level. Since housing programs generally have construction standards and cost limits, it is assumed that comparable "decent homes"

are provided regardless of race. Comparability between subsidized white and minority households, however, is less certain when "suitable living environments" or the socioeconomic characteristics of neighborhoods in which they respectively locate are considered.

An analysis of federal housing programs in light of the cited housing goals and federal responsibility, therefore, falls logically within the purview of geographic investigation. Investigation of the relationship of man to his environment has long been one of the cornerstones of geographic study and is the focus of this research. Geographic research pertaining to man and his environment has been cyclical within the mainstream of geographic inquiry. This inquiry has ranged from the environmental determinism of the late 19th and early 20th Centuries to a rather unrealistic possibilism, perhaps reflecting the discipline's overreaction to criticism of environmental determinism and buoyed by the unparalleled technological progress of the last several decades. Resource shortages, accompanied by spiraling population growth and pollution, have recently revived interest in problems relating to environmental limits on man's activities.

Few geographers would posit a direct causal relationship between either physical, political, economic and social environments and a particular consequence. They, as well as researchers in other disciplines, however, generally agree that the surrounding environment does influence results. A slum environment, for example, does not automatically mean that every person reared there will be characterized by low income and poor education. The impact of a high level socioeconomic environment does not guarantee that all persons reared there will achieve high incomes and a good education. There is ample

evidence to suggest, however, that these two contrasting environments do offer differing possibilities and potentials for their respective residents. Generally, as defined by society, high quality environments tend to coincide with favorable results and low quality environments tend to coincide with less favorable or unfavorable results.

An analogy may serve to further illustrate these relationships within a socioeconomic framework, relationships which are basic to this particular research. A hilly region contains varying portions of land at both high and low elevations. Any two elevations of land are joined by sloping land which in some places may be gradual and in other places steep. Contour maps serve as graphic representations of such physical landscapes. Just as any region may be characterized by its physical topography, an urban area may be characterized by its socioeconomic terrain. There are areas of relatively high socioeconomic elevation and other areas of low socioeconomic elevation. High peaks and ridges may be considered as desirable residential areas while, alternately, low areas may be considered undesirable residential areas. As households improve their socioeconomic position and relocate, they tend to move across the socioeconomic surface of the city to higher socioeconomic elevations. Just as absolute and relative elevations of the physical landscape change over time, so do absolute and relative socioeconomic elevations of different areas of the city.

Subsidized housing programs relocate households at various points on this socioeconomic surface. For a given household, the residential relocation decision may involve remaining at a similar socioeconomic elevation or moving to lower or higher socioeconomic elevations. The "suitable living environment" goal, therefore, largely depends upon

where a subsidized household is relocated upon the socioeconomic terrain of the city. Federal responsibility insuring racial equality with respect to the "suitable living environment" goal suggests that minority and white households should, on average, be located at comparable elevations along the socioeconomic surface.

Existing and proposed federally subsidized housing programs cannot be satisfactorily studied employing theories based solely on household location choice as an extension of consumer behavior theory for the simple reason that subsidized households do not decide where their housing units will be located.

The contention here is that, ceteris paribus, (1) housing units located at higher elevations on the socioeconomic terrain of a city provide a greater subsidy and a more suitable living environment to the average low income household, and (2) adherence to nondiscrimination in the implementation of federal housing programs means that, on average, white and minority households within the same housing program should be located at comparable elevations upon the socioeconomic terrain.

Research Objective

The objective of this research is to develop a procedure for evaluating certain locational aspects of federally subsidized housing programs at the intraurban level. More specifically, this evaluation procedure is designed to: (1) determine whether, through the current spatial allocation of subsidized units, the various housing programs are locating their housing units in neighborhoods offering comparable socioeconomic environments, and (2) determine whether, within each separate housing program, white and minority households are being located in neighborhoods with comparable socioeconomic environments.

The first objective addresses the "suitable living environment" housing goal in which neighborhoods with higher socioeconomic environments are assumed to provide more suitable living environments and a higher housing subsidy level. The second addresses the responsibility of the Department of Housing and Urban Development (HUD) to achieve racial equality in the operation of its housing programs. Additionally, this research provides some insight into the current housing debate between the efficacy of supply-side versus demand-side housing programs.* Housing subsidy levels and racial equality between six supply-side programs and one demand-side program are compared to determine which type of housing program offers greater potential in achieving the specific housing goals considered in this research.

Chapter Organization

The research topic and research objectives have been presented. The steps taken to achieve the research objectives are outlined in this chapter. In Chapter II a discussion of the background to the problem and a review of the pertinent literature is provided. This chapter also contains the assumptions and value judgments which explicitly and implicitly guide the research and casts the research problem in a more theoretical welfare geography framework. A description of the study area, data acquisition and selection, and the housing programs investigated are presented in the first part of Chapter III. The

*Supply-side programs are directed at constructing additional housing units thereby increasing the supply of low income housing. Demand-side programs provide transfer payments to low income households which permit them to bid in the private market for housing they otherwise could not afford. Proponents of this approach argue that housing supply will be stimulated indirectly while critics argue that without supply-side programs the demand-side approach will drive up the price of housing.

methodology by which the socioeconomic surface is estimated, the various housing programs compared, and racial equality determined concludes this chapter. The development of the socioeconomic surface for the study area is the focus of Chapter IV. In Chapter V the locational and housing subsidies provided by various housing programs are compared. The racial equality issue in each housing program is investigated in Chapter VI by comparing locational and housing subsidies achieved by white and minority households in Jacksonville, Florida. In Chapter VII the racial and spatial dimensions of the problem are linked by analyzing racial equality through an investigation of the racial and socioeconomic characteristics of census tracts in which subsidized housing units are located. Conclusions and a housing allocation framework directed at alleviating the problems identified in the current study are presented in Chapter VIII.

CHAPTER II

LOCATIONAL AND RACIAL ASPECTS OF FEDERAL HOUSING PROGRAMS: BACKGROUND FOR THE RESEARCH PROBLEM

This research is directed toward the question of the level of subsidization and racial equality achieved through the spatial allocation of federally subsidized housing programs in an urban area. The immediate objective of this chapter is to demonstrate and document the need for the present research by providing background for questions central to it. Of particular importance here is the demonstration of the importance of location in subsidized housing programs, the origin and evolution of the federal government's role and responsibilities in housing programs, the summary of previous related research, and the casting of the research problem within a theoretical framework.

The Importance of Location

The impact of location of federally subsidized housing units can and must be considered from the perspective of those households being subsidized as well as from that of households living in neighborhoods within which subsidized housing units are established. In the first instance, the subsidized household receives not only a physical housing unit but also an entire "housing bundle" (Smith, 1970; King, 1973). The "housing bundle" includes more than the dwelling unit and the immediate property. There are numerous services, both public and private, and other amenities associated with the location of a housing unit. It is reasonable to assume that when a low socioeconomic status

(SES) household is relocated in a neighborhood of higher SES with its better schools, fewer environmental health problems and less crime, the household receives a superior "housing bundle." Improving or deteriorating socioeconomic conditions in a neighborhood invariably have favorable or unfavorable effects on dwelling units and thereby on the households occupying them (Stegman, 1970; Schaffer, 1973; Sternlieb and Burchell, 1973).

The location of subsidized housing units must also be viewed from the perspective of families living in neighborhoods in which low income housing units are introduced. It is logical to posit that these households absorb the economic and social costs which the introduction of additional low income households may produce (Harvey, 1972b; Downs, 1973a and 1973b). Neighborhoods with higher SES characteristics are presumed to be in a better position to withstand attendant economic and social costs which may be generated by the movement of low SES households into them.

If either white or minority subsidized households are consistently being located in neighborhoods of significantly higher or lower socioeconomic characteristics (receiving more or less favorable "housing bundles") than another racial group, it would appear that racial inequality is being at least perpetuated and perhaps fostered through practices based on the differential location of white and minority occupied housing units. Also, if neighborhoods comprised of one racial group are more frequently absorbing the economic and social costs generated by the location of low SES households, then racial inequality from the nonsubsidized resident's point of view is being perpetuated.

Housing Goals and the Evolving Role of the Federal Government

In the United States prior to the 1930s, except in times of war, housing remained a private market decision. Massive unemployment during the Depression contributed to a devastating financial situation in which many families were unable to honor their mortgage payments and few families had the financial resources to afford the large down payment necessary to purchase a home. This economic crisis prompted the federal government to act. As the crisis in mortgage lending and accompanying foreclosures intensified, the Home Loan Bank System (12 USC 1421) and Home Owners Loan Corporation (12 USC 1461) were established. The former was established to rescue savings and loan associations while, at the same time, requiring them to invest in real estate mortgages. The latter assisted families for whom mortgage foreclosure was imminent while shoring up the banking system by protecting depositors from loss of savings.

The establishment of the Federal Housing Administration (FHA) in 1934 (12 USC 1701) dramatically liberalized the operation of mortgage markets. By insuring lenders against risk, loan values as a percentage of home values were greatly increased, therefore enabling many more families to purchase a housing unit. This, in turn, stimulated real estate investment. Although these initial government actions were directed at upper and middle income groups, they demonstrated the essential and beneficial role which government policy could play in alleviating national financial and housing problems.

Low Income Housing Programs

The first federal housing program directed toward low income groups was the Public Housing Program of 1937 (42 USC 1401). Under this

legislation local housing authorities were established and housing projects were exempt from the property tax so that rents could be reduced. The Housing Act of 1949 proclaimed the goal of "a decent home and suitable living environment for every American family." A six-year target of 810,000 public housing units was set by the 1949 act, a target not reached for twenty years and several additional housing programs later. Such supply-side housing programs as Sections 23, 202, 221(d)(3), 235 and 236 have been subsequently enacted. The Nixon Administration initiated the Experimental Housing Allowance Program (EHAP), a demand-side housing program.*

Linking the Locational and Racial Issues

During the 1960s location and race slowly became interrelated issues in housing programs. An executive order (No. 11063) by President Kennedy forbade racial discrimination in the operation of federally operated programs. The subsequent Civil Rights Acts of 1964 and 1968 (42 USC 2000d; 42 USC 3601) further linked racial discrimination and policies guiding the location of federally subsidized housing units. Unfavorable court rulings against local housing authorities and the Department of Housing and Urban Development (HUD), however, brought the racial-locational issue in housing programs to the forefront. In Geautreaux v. The Chicago Housing Authority (448 F2d 731 (7th Cir 1971)) the court concluded that HUD had violated the Fifth Amendment of the Constitution and Title VI of the Civil Rights Act of 1964 by approving the location of public housing principally in black neighborhoods.

*Both the supply-side and demand-side housing programs investigated are discussed in greater detail in Chapter III.

Title VI specifically forbids racial discrimination in the operation of federally assisted housing programs. The court in Shannon v. U. S. Department of Housing and Urban Development (436 F2d 809 (3rd Cir 1970)) similarly concluded that HUD's lack of a policy for the location of subsidized housing projects caused racial concentration thereby violating the Civil Rights Acts of 1964 and 1968. The development of Project Selection Criteria in 1972 by HUD (explained in greater detail below) was one of the Agency's responses to these court rulings.

The "decent home and suitable living environment" goals have been reaffirmed in the Housing Act of 1968 and the "suitable living environment" given even greater definition in the Housing and Community Development Act of 1974. The act states:

the primary objective of this title is the development of viable urban communities, by providing decent housing and a suitable living environment and expanding economic opportunities, principally for persons of low and moderate income. (PL 93-383, p. 1)

Concomitant with this primary objective are the following more specific secondary objectives:

1. the elimination of slums and blight and the prevention of blighting influences and the deterioration of property and neighborhood and community facilities of importance to the welfare of the community, principally for persons of low and moderate income;
2. the elimination of conditions which are detrimental to health, safety, and public welfare, through code enforcement, demolition, interim rehabilitation assistance, and related activities;
3. the conservation and expansion of the Nation's housing stock in order to provide a decent home and suitable living environment for all persons, but principally those of low and moderate income;

4. the expansion and improvement of the quantity and quality of community services, principally for persons of low and moderate income, which are essential for sound community development and for the development of viable urban communities;

5. a more rational utilization of land and other national resources and the better arrangement of residential, commercial, industrial, recreational and other needed activity centers;

6. the reduction of the isolation of income groups within communities and geographical areas and the promotion of an increase in the diversity and vitality of neighborhoods through the spatial deconcentration of housing opportunities for persons of lower income and the revitalization of deteriorating or deteriorated neighborhoods to attract persons of higher income; and

7. the restoration and preservation of properties of special value for historic, architectural or aesthetic reasons. (PL 93-383, pp. 1 and 2)

The primary and secondary objectives, particularly objective six, demonstrate the need for a more rigorous consideration of the locational variable and an evaluation of housing programs with respect to their spatial impact.

HUD also specifies its responsibility for insuring racial equality in the operation of its programs. Programs of HUD are not allowed to:

provide any housing, accommodations, facilities, services, financial aid or other benefits to a person which are different, or are provided in a different manner, from those provided to others under the program or activity;

subject a person to segregation or separate treatment in any matter related to his receipt of housing, accommodations, facilities, services, financial aid or other benefits under the program or activity; and

restrict a person in any way in access to such housing, accommodations, facilities, services, financial aid or other benefits, or in the enjoyment of any advantage or privilege enjoyed by others in connection with housing, accommodations, facilities, services, financial aid or other benefits under the program or activity. (24 CFR 1.4)

The locational advantages a subsidized household may enjoy are improved neighborhood conditions, services and other benefits, such as better schools, less crime, more varied facilities for shopping and greater access to job opportunities. Although it would be impossible for HUD to provide identical "housing bundles" to each subsidized household, the agency is required to insure that the racial characteristics of a household do not preclude the household's opportunity of receiving "housing bundles" comparable to other racial groups.

The problem of public facility location, in general, has been neglected (Thompson, 1965; Harvey, 1973). Research pertaining specifically to consideration of the location of federally subsidized housing units has also been neglected, despite the growing need for such research. Low income housing programs have been found to perpetuate, complement, and, in some instances, increase existing racially and economically segregated residential patterns (Glazer and McEntire, 1960; Grier and Grier, 1960; McEntire, 1960; Davies, 1966; Friedman, 1968; Freedman, 1969; Fried, 1971). For example, several of these studies cite the location of predominantly minority occupied public housing projects in low income, minority dominated central city areas in different American cities. Although the dual concerns of the suitability of the socioeconomic environment in which subsidized housing units are located and the racial impact of various housing programs have not gone unnoticed (Taggart, 1970; Downs, 1973a and 1973b; Haar and Iatridis, 1974; Rubinowitz, 1974; Solomon, 1974), they have escaped sustained and systematic investigation. These studies dealing with locational aspects have done so only in very general terms and have failed to demonstrate explicitly the socioeconomic disadvantages and inequalities which may result from continued residential segregation.

Misdirection of the Racial-Locational Issue

The failure to specify and document clearly what socioeconomic inequalities racial segregation perpetuates has led to equally general locational remedies for the low income housing allocation problem. Researchers have expressed the need to suburbanize low income housing (Gans, 1968; Downs, 1973a and 1973b; Kain, 1973; Haar and Iatridis, 1974; Rubinowitz, 1974). Implicit in this expression is the unrealistic belief that suburban areas are immune from the same deteriorating processes so widely documented for certain central city areas (U. S. Commission on Civil Disorders, 1968; Stegman, 1970 and 1972; Molotch, 1972; Schaffer, 1973).

The emphasis afforded racial segregation, per se, in the literature and recent court rulings, may serve to direct attention away from a more serious problem accompanying segregation, the perpetuation of socioeconomic inequality based on race and accomplished in space. Since surveys indicate that a majority of whites and a significant percentage of blacks express a preference for living in neighborhoods dominated by their own racial group (Bradburn, Sudman and Gockel, 1971, p. 121; New, Mausner and Shapiro, 1971, p. 42; Gruen and Gruen, 1972, p. 35), it will be necessary for researchers to demonstrate in what ways racial segregation fosters socioeconomic inequality and how alternative spatial allocation patterns can alleviate this inequality. The need to assess racial-locational inequality rests on the pragmatic belief that integration viewed for the sake of integration, although it may be upheld in the courts, is unpopular with many whites and minorities alike and, therefore, will be difficult to implement and enforce.

HUD's Project Selection Criteria

As previously noted, HUD has been charged with the responsibility of insuring racial equality in federal housing programs. The development of Project Selection Criteria (Rubinowitz, 1974, pp. 139-143) represents HUD's attempt to comply with the unfavorable court rulings cited earlier. These criteria as now established may satisfy the courts; however, they appear to be deficient in several important respects.

The following eight criteria comprise the Project Selection Criteria areas of interest. They are:

- (1) need for low(er) income housing, (2) minority housing opportunities, (3) improved location for low(er) income families, (4) relationship to orderly growth and development, (5) relationship of proposed project to physical environment, (6) ability to perform, (7) project potential for creating minority employment and business opportunities, and (8) provision for sound housing management. (37 FR, pp. 204 and 205)

Each proposed housing project is given a rating of superior, adequate or poor for each of the eight criteria. The adequacy of the three-grade rating system is debatable. Although HUD does describe situations under all criteria that warrant a superior, adequate or poor rating, each situation entails several different variables which could be more systematically reconciled by a multipoint system of grading. The three-grade system departs from reality in which neighborhoods throughout an urban area are more likely to approach a continuum of socioeconomic and physical environments rather than discrete superior, adequate or poor environments. Under HUD's system the considerable variability within each category is lost. HUD defends its grading system, stating:

the Department believes that the three-grade system (superior, adequate, poor) is best. An acceptable-unacceptable rating system would not provide a priority for funding. On the other hand, a multipoint system is not necessary because the three-grade system gives a sufficiently wide range of priorities, and the assignment of a numerical range of point values within each criteria would require drawing impractically fine distinctions with respect to factors which often involve broad value judgments. (37 FR, p. 203)

The introduction of low income families (with their attendant needs and problems) into certain adequate environments, as defined by HUD's criteria, may reduce the socioeconomic quality of these environments to the poor category, a possible outcome which could be guarded against by use of a more detailed multipoint grading system. For instance, ten neighborhoods which HUD considers adequate, on a multipoint system, might range in value from 35 to 70 (representing barely adequate to very adequate). Relocating a number of low income families (N) in a neighborhood with a value close to 35 could move the neighborhood into the poor category whereas a neighborhood with a value of 70 is more likely to be able to absorb that number of additional low income families and still maintain its favorable socioeconomic characteristics and adequate rating. A multipoint system would provide a more sensitive measure by which to evaluate housing policies and individual programs.

Furthermore, HUD's Project Selection Criteria are passive since only projects and environments which have been proposed are evaluated. This fact and political expediency may mean that only the best of poor alternatives will be selected. To achieve our nation's housing goals and meet federal responsibility, it will be necessary for HUD to devise more comprehensive and dynamic monitoring and evaluation criteria.

Summary of Research on Subsidized Housing Programs

It would seem appropriate as well as necessary given its responsibilities for HUD to devise more specific and effective procedures by which to evaluate the socioeconomic environments within which subsidized housing units are located and to determine whether white and minority subsidized households are being located in comparable environments. Most technical works and the few models dealing with federal housing programs have focused almost exclusively on the production of subsidized housing units (O'Elock and Kuehn, 1970; Taggart, 1970; Aaron, 1972; Ricks, 1973; Solomon, 1974). These studies have provided needed insights regarding the financing mechanisms involved in the various housing programs and their subsequent impact on the quantity of housing produced and the depth of the housing subsidy.* None, however, have provided a framework for assessing the quality of the socioeconomic environments in which subsidized housing units are located and the location of white and minority households within these environments. Solomon (1974) concentrates on production aspects and develops cost-benefit analyses comparing several federal housing program approaches. He does remain cognizant of the locational, qualitative and environmental aspects of housing programs and treats these important concerns in a separate chapter. Solomon's conclusions, however, seem to rest more on a theoretical rather than an empirical analysis of housing programs.

*The deeper the housing subsidy, the larger the proportion of rent paid by the federal government. Deeper subsidies permit lower income families to be assisted.

Studies which have investigated the racial-locational or environmental dimensions of housing have done so assuming the traditional free-functioning private housing market (Muth, 1969; King, 1973; Schnare, 1974). Clearly, subsidized housing units are an exception and cannot be analyzed satisfactorily by simply employing the theory of household location choice as an extension of consumer behavior theory.

Despite the housing program goals, court rulings, and federal responsibility, recent studies detail cases of racial discrimination in federally subsidized housing programs (George, 1971; Peel, Pickett and Buehl, 1971; U. S. Commission on Civil Rights, 1971). The Civil Rights Commission report found racial-locational differences in the operation of the Section 235 home ownership program in Denver, Little Rock, Philadelphia and St. Louis. Blacks were being subsidized in rehabilitated housing units in central city areas which were primarily black or progressing toward higher black occupancy rates. Whites were being subsidized to purchase newly constructed homes in suburban areas. The failures cited in many of these studies could have been averted had existing housing programs and federal responsibility been adequately monitored, evaluated and enforced so as to insure that such situations did not arise.

A Theoretical Approach to the Problem

Although this research is an empirical evaluation of subsidized housing programs measured against the two criteria of the level of subsidization and racial equality achieved through the spatial allocation of subsidized housing units, these problems should be cast in a theoretical framework.

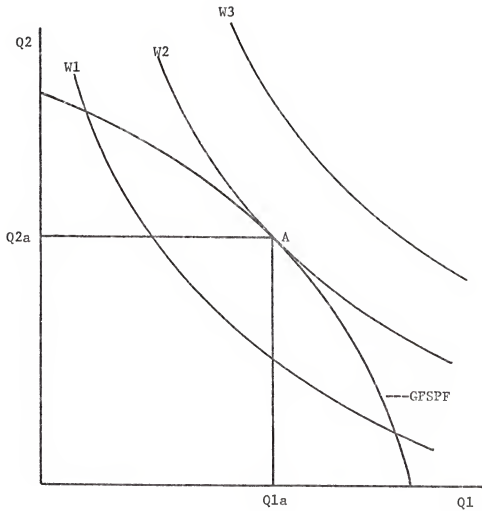
Of particular relevance are the recent developments in welfare geography. Smith (1973a) supplies a definition and objective for welfare geography:

The objective of welfare geography is the evaluation of the social desirability of alternative geographical states. Theoretical welfare geography is, then, that branch of study which endeavors to formulate propositions by which we may rank on a scale of better or worse alternative geographical situations open to society.... Geographical patterns of all kinds can be judged with respect to their contributions to welfare, with the objective function of welfare maximization substituted for the more conventional, but less inclusive optimizing criteria of cost minimization, profit maximization, or economy in the coverage of distance. (p. 3)

Smith develops theoretical spatial welfare states from aspatial welfare economics, a development presented here in significantly abbreviated form.

Theoretical welfare economics is an extension of consumer behavior theory in which, subject to a technical constraint, an optimum welfare level is substituted for optimum consumer satisfaction in commodity space. Figure 1 depicts the outcome of the allocation of two resources, Q1 and Q2, which contribute to a community's welfare, a community's welfare indifference curves (W1, W2 and W3), and the "Geographically Feasible Social Production Frontier," GFSPF (Smith, 1973a, p. 24). The GFSPF represents the maximum welfare levels a society or community can produce by technically constrained combinations of Q1 and Q2. Social welfare is maximized by a combination of Q1a and Q2a at point A, since this is the point on the GFSPF which achieves the highest possible welfare level, W2. Movement away from this point either reduces welfare or violates the technical constraint represented by the GFSPF.

Harvey (1972a) and Smith (1973a) have cautioned geographers to avoid a methodological trap which they feel many welfare economists



$GFSPP$ = Geographically Feasible Social Production Frontier

Q_1 and Q_2 = two resources producing community welfare

W_1 , W_2 and W_3 = increasingly higher community welfare levels

Figure 1

Welfare Levels Produced by Combinations of Two Resources

have fallen into. The trap is the employment of the Paretian value judgment which often leads to ignoring important distribution and social justice questions. The Paretian value judgment permits decisions which make certain persons better off only if other persons are not simultaneously made worse off. This means that the rich can get richer while the poor remain as poor, but making the poor less poor is not acceptable if the rich become less rich. A welfare economist's hedged caution reads:

since theoretical welfare economics is based on the Paretian value judgment, its conclusions are relevant only if that judgment is accepted. If instead we believe that what is desirable depends upon government belief of what is good for the individual, rather than upon his own utility function, then the conclusions of Paretian welfare economics could not be expected to imply policies appropriate to the achievement of our social objectives. (Winch, 1971, p. 28)

An individual deciding his or her own utility is an acceptable and necessary precept of democratic government. Society, however, often through governmental policies restricts individuals who attempt to satisfy their personal utility functions at the economic or social expense of others. Compulsory education, taxation and countless other societal decisions may curtail an individual's optimization of his or her own utility function. These limits are believed justified because of the collective good or socially desirable results which such governmental actions are said to produce.

Although the Paretian value judgment may make sense in the uncluttered theorizing of commodity and utility space, costs and benefits, secondary and spin-off effects, externalities and social costs in the real world caution against its applicability. Perhaps the main weakness of the Paretian value judgment is the fact that in

addressing real world problems in which many existing disparities have been generated by non-Paretian decisions, it seems counter intuitive to consider only Paretian satisfying forms of redress.

Harvey (1972b) concludes that many contemporary problems stem from disequilibrium in the urban space economy. He further contends that the difficulty we have in effectively analyzing and attacking these problems often rests in our restrictive methodologies, as exemplified by Paretian economics (Harvey, 1972a). He maintains that the urban space economy is not benign; it is controlled to a large extent by the individuals and institutions with power to direct the space economy, thus:

the source of disequilibrium lies in the drive to appropriate the surplus by certain groups in the population. One tacit way of appropriating it is to get into a position in which the group bears very little of the total social costs of generating the surplus. This is exactly what the residents of many suburban municipalities are doing and it is a technique which is allowing, for perhaps the first time in history, a middle class population (as opposed to the capitalist) to appropriate a substantial portion of the surplus. (Harvey, 1972b, p. 24)

He also provides examples of how the location and operation of retail stores, medical care, water utilities, noxious facilities and the housing market work in favor of power groups, invariably, operating to the benefit of higher income groups in certain areas of the city and against groups lacking power, the poor, in other areas of the city. Unlike some studies which single out particular villains in the substandard housing and neighborhood decline problems, Harvey illustrates how unequal spatial outcomes are generated even when various housing market actors are performing honorably. Harvey and Downs (1973b) maintain that the housing market works to the spatial advantage of

certain areas (currently suburbs) and against other areas (central cities). Households and their owned or rented properties are affected by this general process:

If the schools deteriorate, if a noxious facility is located nearby, if 'undesirable social groups' move into a neighborhood, if the standards of provision of public services falls (garbage is not collected, roads are not properly maintained), if job opportunities nearly decline, then both the use-value and the exchange-value of the property will be affected (particularly if the situation in other neighborhoods improves). Similarly, if schools and services improve, if new employment opportunities are created nearby, if accessibility is improved, if public services improve, then both the use-value and the exchange-value of the house improve. (Harvey, 1972b, p. 35)

Such occurrences in a neighborhood are not the result of any single housing market actor's decisions, although the decisions of each actor contribute to and reinforce improving or deteriorating neighborhood conditions. Both private market and government decisions, such as those connected with federal housing programs, whether intentional or not, favor certain areas of a city and disfavor others. People live in both favored and disfavored areas. Those people living in favored areas, therefore, benefit while those living in disfavored areas pay the economic and social costs of this spatial disequilibrium.

The location of federally subsidized housing programs can be viewed as a welfare disequilibrium or equilibrium generating decision. A theoretical linking of the research objective to welfare geography follows. Within the theoretical framework provided, various location patterns of subsidized housing units "can be judged with respect to their contributions to welfare" or the total housing subsidy "with the objective function of welfare maximization substituted for the more conventional, but less inclusive optimizing criteria of cost minimization,

profit maximization, or economy in the coverage of distance" (Smith, 1973a, p. 3). The following section of this chapter analyzes the allocation of subsidized housing units from the perspective of both subsidized and nonsubsidized households. The welfare aspect is initially considered from the subsidized household's point of view.

The housing subsidy (HS) can be divided into its spatial and aspatial components, the locational subsidy (LS) and the housing structure subsidy (HSS). The following equations, graphs and discussion simplify and summarize the primary concerns and assumptions guiding the research within a welfare geography context.

$$HS^* = \sum HSS + \sum LS$$

where,

HSS = Cost of subsidized housing unit if at private market price minus cost to low income family for subsidized housing unit,

and

$$LS = \sum \text{Benefits} - \sum \text{Costs stemming from location.}$$

The HS can be thought of as a measure of a subsidized household's welfare and is maximized by maximizing HSS and LS. The HSS is increased by providing a better housing unit. The LS is maximized when housing units are located in neighborhoods in which socioeconomic variables (benefits) are maximized and other variables (costs) are minimized.

Combinations of HSS and LS yielding different HS levels can be depicted in a manner similar to welfare levels produced by combinations of Q1 and Q2 in Figure 1. Figure 2 illustrates this situation. The "Geographically Feasible Social Production Frontier" (GFSPF) is replaced

*This can also be thought of as the "housing bundle" provided by a subsidized housing program.

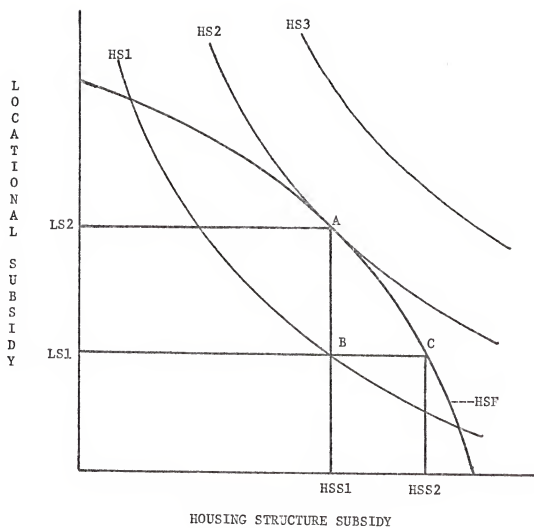


Figure 2

Housing Subsidy Levels Produced by Combinations of the
Locational and Housing Structure Subsidies

by a Housing Subsidy Frontier (HSF). Increasing housing subsidy indifference levels are represented by HS1, HS2 and HS3, and combinations of HSS and LS determine the HS level achieved. A combination of HSS1 and LS2 produce the highest possible housing subsidy level at point A where the HSF is tangent to HS2. A combination of HSS1 and LS1 produce HS1 at point B. Increasing to HSS2 at LS1 increases the HS level to point C, but never to the HS2 level achieved at point A.

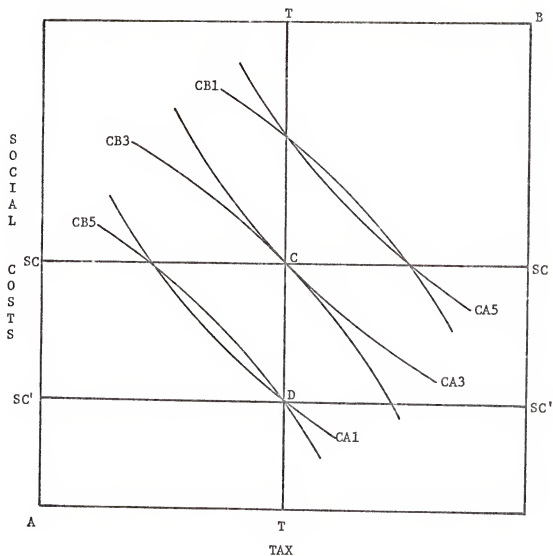
Figure 2 illustrates that locating households with identical welfare or housing subsidy indifference curves in identical housing units at various sites throughout an urban area can produce different welfare or housing subsidy levels. Location directly affects the housing subsidy levels and, therefore, the welfare levels realized under federally subsidized housing programs. Unfortunately, most studies dealing with the level of the housing subsidy have directed their attention primarily to the HSS measured along the x-axis in Figure 2. Building cost limitations within various housing programs invariably restrict the subsidization levels attainable along this axis so that increases in housing subsidy levels would appear most promising by improving the location of subsidized units.

The value judgment employed in Figure 2 is that higher housing subsidy levels are desirable for all subsidized households. From a welfare economist's and geographer's point of view this value judgment is incomplete, since it does not simultaneously consider the welfare of nonsubsidized households. In Paretian value terms, the depicted increase in welfare levels for subsidized households would not be justified if nonsubsidized households' welfare diminished. Although the Paretian value judgment is not employed in this research because

of its previously cited shortcomings, the impact of subsidized housing programs on nonsubsidized households cannot be dismissed.

The first part of the value judgment concerning nonsubsidized households is that any of the economic or social costs of subsidized housing programs should be equitably shared by nonsubsidized households. In a similar vein, the long-range indirect benefits of housing programs (Heilbrun, 1974, pp. 262-266) should be equitably shared. Taxing policies which support federal housing programs show little spatial favoritism. Identical households with identical incomes are assumed to pay identical tax shares to support federal programs. However, when social costs are considered, some households may escape while others bear the brunt of these costs, often for the spatial disequilibrium reasons outlined above.

Figure 3 depicts an idealized situation in which identical households, A and B, live in identical socioeconomic neighborhoods and are equally taxed (for A, AT; and for B, BT). It is assumed that any social costs generated by the placement of low income housing units are more pronounced for nonsubsidized households living in the immediate vicinity of the low income housing units. Therefore, in Figure 3, A and B's social costs depend on their locations with respect to subsidized low income households. If subsidized households are spread uniformly throughout the two neighborhoods, point C indicates the theoretical tax and social cost solution. At point C, A and B pay the same tax ($AT = ET$), the same social cost ($ASC = BSC$), and where the tax-social cost curve at A, CA3, equals the tax-social cost curve at B, CB3. If, however, the majority of subsidized households are located in B's neighborhood, a solution at point D may arise.



Tax costs $AT = BT$
 Social costs $ASC = BSC$
 Social costs $ASC' < BSC'$
 Tax-social cost curves $CA1 = CB1$, $CA3 = CB3$, $CA5 = CB5$

Figure 3

Theoretical Tax and Social Costs for Households A and B
 Depending on the Location of Subsidized Housing Units

At point D, A and B still pay the same tax ($AT = BT$), but B pays social cost BSC' while A only pays ASC'. Therefore, B is at tax-social cost curve CB5 and A is at CA1. Just as Figure 2 illustrates how different locations can produce different housing subsidy levels for subsidized households, Figure 3 shows how different locations can produce different social costs for nonsubsidized households.

There are neighborhoods where social and economic costs are already too high. Visual blight, high crime, decaying schools, housing abandonment, and health problems in certain areas of cities indicate where such situations exist. These areas produce extremely low LS values in Figure 2 and can ill afford the increased social costs suggested in Figure 3. Other neighborhoods possess socioeconomic characteristics providing high LS values and are assumed to be able to absorb additional social costs while maintaining viable living environments. Other neighborhoods may seriously decline if any additional social costs are generated. There is probably a social cost "tipping point" similar to the racial tipping point* often discussed in the literature on residential segregation (McEntire, 1960; Downs, 1973b).

If only the first part of the value judgment of equitably sharing the social costs is adhered to, then extremely different as well as very low LS values and housing subsidy levels could result. A second

*Many works on residential segregation contend that once a certain percentage of minority households enter a neighborhood a situation will result in which white families move out and are replaced almost exclusively by minority households. There may be a social cost tipping point for neighborhoods beyond which higher socioeconomic status households move out and are replaced almost exclusively by low socioeconomic status households. Such a process can trigger neighborhood decline.

part of the value judgment is necessary. It is assumed that neighborhoods providing the higher LS values are also most able to absorb the social costs generated by the introduction of low income households while still maintaining suitable living environments. Therefore, these neighborhoods should receive a higher percentage of low income housing units. Under this value judgment point D in Figure 3 might be acceptable if B's neighborhood possessed higher favorable socioeconomic characteristics than A's and, therefore, was more able to absorb the social costs and still maintain a suitable living environment. In this case, B's neighborhood would also provide a higher LS value, yielding a higher housing subsidy level in Figure 2.

Though these value judgments for this housing allocation problem depart from the one prevailing in welfare economics, they seem appropriate given the objectives of federal housing programs and the responsibilities of the federal government. Furthermore, given the historical processes (many of them non-Paretian) which have contributed to present-day housing problems, it seems only reasonable to consider non-Paretian remedies to these problems. Theoretically, if such value judgments guided policy, eventually neighborhoods would approach similar socioeconomic characteristics and provide comparable LS values. Under such conditions the importance of the spatial variable would be greatly reduced and differences in real income (Harvey, 1971) would hinge primarily on differences in earned income. Surprisingly, most studies are conducted as if these conditions did indeed exist.

Summary and Conclusions

Few studies have simultaneously investigated the impact of location on the housing subsidy level and racial equality achieved under various

federally subsidized housing programs within an urban area. This research focuses on these important issues.

Racial segregation is a fact of American life. The perspective of this research maintains that as long as integration is viewed by whites, blacks and other minorities as an end in itself, residential desegregation efforts will have limited and perhaps little success. For purposes of this research, therefore, if subsidized housing programs are found to perpetuate only racial segregation (court rulings aside), they will be viewed as acceptable. If, however, it can be demonstrated that locational patterns of white and minority occupied housing units also perpetuate socioeconomic inequality based on race, then the implementation of these housing programs will be considered unacceptable.

CHAPTER III

STUDY AREA, DATA AND METHODOLOGY

The census and non-census variables selected to depict the socioeconomic surface of Jacksonville, Florida are presented and discussed. The various housing programs and tenant occupancy data are reviewed. Strengths and weaknesses of the data utilized are discussed. The methodology employed to derive the socioeconomic surface, compare the locational and housing subsidies provided by the various housing programs, and compare the locational and housing subsidies achieved by white and minority households is presented.

Study Area

The study area consisted of ninety census tracts (of a possible ninety-seven) in Jacksonville, Florida.* Each census tract was treated as a uniform plain, in the sense that variables reflect characteristics which were assumed to be uniformly distributed across the entire census tract. The socioeconomic surface generated, therefore, will consist of a series of ninety plateaus.

Census and Non-census Data Sources

Any empirical investigation faces an eventual compromise between what is optimal in terms of data and what is feasible given numerous

*Seven census tracts were excluded because they either contained too small a population, had large institutional populations, or the necessary variables could not be obtained.

constraints. The data set utilized in this research incorporates variables indicative of household, economic, housing, education, crime and health characteristics at the census tract level. Numerous variables and data sources were considered and consulted, but the final selection was limited to twenty variables for which a high performance could be interpreted as a more or less suitable census tract characteristic. Although a larger number of variables could have been used, previous experimentation with the principal components analysis technique indicated that the use of additional variables reflecting more or less suitable census tract characteristics would have merely served to remeasure the same socioeconomic characteristics. Additionally, variables for which a more or less suitable judgment could not be made were not included, since their inclusion would hamper making judgments concerning the relative suitability of census tracts. Also, an attempt was made to select a similar number of variables for each of the six socioeconomic characteristics in order to avoid an a priori assumption that certain characteristics were more important.

Variables Selected to Estimate the Socioeconomic Surface

The twenty variables listed in Table III-1 provide the measures by which the socioeconomic terrain of Jacksonville was developed and against which the various housing programs were subsequently evaluated. The variables (variables measuring more suitable and less suitable characteristics are indicated by + and - signs respectively) are listed in Table 1 under the general socioeconomic characteristic they most immediately measure. A rationale for the six socioeconomic characteristics and for the individual variables selected is provided. Non-census

Table 1

Twenty Variables Utilized to Derive the Socioeconomic
Score for Census Tracts in Jacksonville, Florida

Characteristics and Variables	Data Source	Value
Household:		
1. Units owner-occupied (%)	(1)	+
2. Female-headed households (%)	(1)	-
3. Households divorced or separated of those married (%)	(1)	-
4. Occupied units without automobile (%)	(1)	-
Economic:		
5. Mean family income/average number of persons per household	(1)	+
6. Labor force unemployed (%)	(1)	-
7. Population below poverty level (%)	(1)	-
8. Median home value	(1)	+
9. Median gross rent	(1)	+
Housing:		
10. Units lacking plumbing (%)	(1)	-
11. Units with plumbing but 1.01 more persons per room (%)	(1)	-
12. Rental units for which households pay in excess of 25 percent of income (%)	(1)	-
13. Units with air conditioning (%)	(1)	+
Education:		
14. High school graduates (% over 25 years old)	(1)	+
15. Persons 16-21 years old not in high school or enrolled (%)	(1)	-
16. Composite sixth grade test scores	(2)	+
Crime:		
17. Part I crime rate per 100,000 population	(3)	-
18. Part II crime rate per 100,000 population	(3)	-
19. Violent crime rate per 100,000 population	(3)	-
Health:		
20. Age-adjusted death rate	(4)	-

(1) 1970 U. S. Census

(2) Jacksonville Board of Education

(3) Jacksonville Office of the Sheriff

(4) Jacksonville Experimental Health Association

variables,* their data sources, and the procedure by which they were aggregated to the census tract level are presented in the following sections.

Household Characteristics

The characteristics of households located in a census tract are obviously important environmental considerations. The four variables considered here are not of particular importance in evaluating the welfare of an individual household. These variables, however, assume importance when they are used to evaluate a large number of households in a limited space.

The percentage of owner occupied housing units in a census tract was deemed a positive variable in the environmental sense. Many households aspire to own a home. Numerous studies contend that home owners are more deeply and actively involved in neighborhood events and that this acts as a stabilizing influence in a neighborhood. Sternlieb and Burchell (1973, p. 42), in a factor analysis of thirty 1970 variables by census tracts in Newark, found that the percentage of owner occupied units had the highest positive loading on the most important factor, which they identified as the Race and Resources Factor. Other favorable census tract variables were positively correlated with the percentage of owner occupied units.

*Considerable effort was invested to obtain additional variables to measure important characteristics not enumerated or inadequately represented in the census. Two major difficulties encountered were in aggregating or disaggregating these data to the census tract level and in finding data sources offering the statistical reliability of census information. Of the twenty variables finally utilized, five were obtained from other sources.

A high percentage of female-headed households and households experiencing divorce and separation was considered likely to exert negative neighborhood effects. Households experiencing these conditions often must adjust to psychological, social and economic difficulties accompanying these circumstances (Moynihan, 1968; Fogarty, Rapoport and Rapoport, 1971; Rosenberg, 1972). Since many women lack the skills and/or training, experience and contacts necessary to compete for higher paying jobs, low incomes for female-headed households often result (U. S. Commission on Civil Disorders, 1968).

Households owning an automobile were assumed to have greater accessibility to alternative housing, employment, retail, recreation and health care opportunities. Census tracts in which a large percentage of households do not possess a car are more likely to have households suffering from the spatial disequilibrium and its negative effects, as developed by Harvey (1972b) and discussed in Chapter II.

Economic Characteristics

The cited importance of economic variables throughout the social science literature necessitated their inclusion in any attempt to measure the relative suitability of socioeconomic environments (Gans, 1968; King, 1973; Smith, 1973a and 1973b).

The mean family income of a census tract was divided by the average number of persons per household in the tract. This per capita figure was adopted rather than using the mean or median family income for the following reason. Two census tracts could have identical mean family incomes but one tract average 4.0 persons per household and the other 2.0 persons per household. This would indicate that considerably different socioeconomic conditions and populations exist in the two

census tracts. The number of persons per household by itself was deemed a poor measure of the relative suitability of census tracts. The per capita income figure, however, has greater utility in evaluating the relative suitability of census tracts.

A high unemployment rate and the percentage of the population living below the poverty level were selected to depict undesirable neighborhood conditions. High median home values and median gross rents were assumed to reflect census tracts providing a higher level of housing services.

Housing Characteristics

Housing units lacking plumbing facilities and those with complete plumbing facilities but having 1.01 or more persons per room (Report of the President's Committee on Urban Housing, Volume I, 1968b, p. 51) were selected to indicate the extent of structurally deficient and overcrowded housing conditions. Only overcrowded housing units with complete plumbing facilities were considered in order to avoid double counting those overcrowded units which also lacked complete plumbing facilities.

Although it is biased against census tracts containing a higher percentage of apartments and rental homes, the percentage of all occupied units for which rent exceeds 25 percent of the household's income was used as an affordability measure related to housing. It cannot be determined from the census what percentage of home owners may have paid in excess of 25 percent of their income on housing. This is probably not as extensive a problem for home owners for the following reasons. The fact that home owners have been able to procure mortgages indicates their financial capability. Additionally, rents are more responsive to inflationary pressures while mortgage payments remain

fixed, although other housing expenses for home owners, such as maintenance and utilities, do increase. Even if home owners are spending in excess of 25 percent of their income on housing, they are able to recover some money through the federal income tax system which favors home owners by allowing them deductions not available to renters (Aaron, 1972). Furthermore, a home owner's payments represent an investment as well as a purchase of housing services. It might be anticipated that areas in which a high percentage of renters are paying in excess of 25 percent of their income on housing are likely to be the same areas in which a high percentage of home owners are doing the same.

The percentage of a census tract's housing units with air conditioning was felt to be an appropriate variable, given that high temperature and humidity are extant over half the year in Jacksonville. Although air conditioning, like the television, may have been considered a luxury at one time, it is a housing service which middle and, increasingly, even lower socioeconomic status households are starting to expect, particularly in warmer regions of the United States, such as Florida.

Educational Characteristics

Several important spin-off effects of improved education have been cited:

A catalogue of the principal external benefits of primary and secondary education includes: (1) informed participation in the democratic political system; (2) increased adaptability to changing economic and social conditions with consequent reduced costs of unemployment and social displacement; (3) reduction in antisocial behavior of those who lack the skills to be viable members of society; (4) increased productivity of the whole labor force; (5) a more varied and pluralistic culture and humanistic life style; and (6) equal education opportunity, leading to reduced income inequality. (Neenan, 1972, pp. 206 and 207)

The number of years in school has been found to be significantly related to earning, home ownership and numerous other positive aspects of an individual's or household's life. Census tracts with a high percentage of persons 16 to 21 years old not in high school or enrolled can be expected to evidence some of the unfavorable characteristics indicated above.

The average sixth grade test score is felt to be an important addition to the census variables on education. Numerous studies have cited the desire of families to place children in good schools (Rossi, 1955; Bradburn, Sudman and Gockel, 1971; Gruen and Gruen, 1972); this desire has been found to be an important factor in many families' residential relocation decision. Therefore, the quality of schools was considered an important factor in determining a neighborhood's suitability. The performance of students on standard tests is a relatively good measure of the quality of schools within a city. The use of this variable in no way resolves the debate between the influences of genes and/or environment on cognitive ability; nevertheless, the use of test scores in the environmental context is substantiated:

In real life, both differences in genes and differences in environmental factors that are not affected by genes contribute to cognitive inequality. The 'heritability' of test scores is the percentage of the total variation that can be 'explained' by genes under real life conditions. As we shall see, our best estimate is that genes explain about 45 percent of the variance in American test scores, that environment explains about 35 percent, and that the tendency of environmentally advantaged families to have genetically advantaged children explains the remaining 20 percent.... The relationship between test scores and economic background also seem stronger in the United States than in other countries. This reinforces our conviction that the range of environmental variation is greater in the United States than in most other industrial countries. (Jencks, 1972, pp. 66 and 78)

If the above convictions are valid, then greater educational inequality and other inequalities education affects can be perpetuated through differential locational policies.

To obtain this variable, nine test scores were obtained for sixth graders for ninety-six elementary schools in Jacksonville for the 1969-1970 academic year.* Since this period preceded the implementation of busing directed at racial desegregation, a school's score was assigned to the census tract in which the school was located. Tracts containing two or more schools were assigned average test scores weighted by the number of students taking the test at each school. Average test scores were calculated in this manner for seventy-two census tracts containing at least one elementary school. A procedure averaging the scores of neighboring census tracts with schools was utilized to assign test scores to the eighteen census tracts without a school. A census tract's composite score for the nine test scores was used as the school performance variable.

Crime Characteristics

Census information does not include estimations of another important aspect of society, namely, crime. Perhaps no urban phenomenon has received the attention and has been debated more than crime has in the past several years within the United States. Three variables, expressed as crime rates per 100,000 population for Part I, Part II and violent

*The nine test scores measured students' performance in word meaning, paragraph meaning, spelling, language, arithmetic comprehension, arithmetic concepts, arithmetic application, social science and science.

crimes,* were selected for use. Although these data do not adequately depict "white collar" or corporate crime, as discussed by Smith (1974) and others, they do represent the best crime data base currently available and an important addition to this research effort. To minimize the influence of picking an abnormal year or a year in which crime patterns for a certain geographic area were uncharacteristically high or low, it was necessary to average crime rates for 1971, 1972 and 1973.

The number of crimes reported by fifteen Federal Bureau of Investigation (FBI) crime categories were obtained for 310 police reporting areas in Jacksonville for 1971, 1972 and 1973.** These data were aggregated to the census tract level and subsequently collapsed into the three crime variables discussed above.

The detailed crime reporting procedure was initiated in 1971; thus, the collection date of the crime statistics does not coincide exactly with the census data. Census tracts are large enough so that their

*Seven categories of crime are considered under Part I crimes. They are homicide (murder and manslaughter), forcible rape, robbery, aggravated assault, breaking and entering, larceny (except motor vehicle theft), and motor vehicle theft. Part II crimes consist of all non-Part I crimes. The violent crimes are murder, forcible rape, robbery and aggravated assault. The violent crimes are double counted since they are also in the Part I figures. This was done since violent crimes were considered more important and tended to be overshadowed by the more numerous crimes of breaking and entering, larceny and motor vehicle theft in the Part I category.

**The Planning and Research Unit staff in the Office of the Sheriff was most cooperative in providing the information and a work space for the researcher. The unit's Census Tract-Reporting Area Designation Table facilitated aggregating the information to the census tract level.

socioeconomic characteristics tend to change gradually so that the difference of two years should not prove too serious a problem. Increasing or decreasing patterns of crime are becoming a major concern of urban residents and represent a good indicator of favorable or unfavorable neighborhood conditions. Given the objectives of this research and the good quality of the crime data, the inclusion of the crime variables was considered to outweigh the limitation in temporal comparability.

Health Characteristics

Unfortunately, only one variable, age-adjusted death rate, was used as a surrogate measure of environmental health conditions in census tracts. This variable was obtained from a publication of Jacksonville Experimental Health Delivery System, Inc. (1974). This statistic was the result of only eight months of data collection in 1973 and was averaged over a twelve-month period. It was used, despite its acknowledged shortcomings, because of the absence of other health-related variables at the census tract level. Data pertaining to levels of particulate pollutants were gathered, but, due to the limited number of only ten recording stations in the city, the use of these data with any degree of confidence at the census tract level was judged inappropriate.

Housing Program Data

A brief review of the seven federal housing programs investigated in this research is provided. This review closely follows that of Downs (1973a).*

*More extensive discussions of these programs can be found in Taggart, 1970; and Aaron, 1972.

Conventional Public Housing

A local housing authority (LHA) is established and floats bonds to pay for the construction of multi-family units while the federal government annually pays the debt service on the bonds. The local area's contribution is the difference between what the property tax would be on the public housing property and the 10 percent of rents in lieu of property taxes paid to the local government by the LHA. Turnkey public housing projects are provided somewhat differently. Private builders find sites and construct multi-family projects which the LHA then purchases from the builder. Financing and tax subsidies are the same as under the conventional approach, although LHAs are no longer involved in construction. The turnkey method has speeded the construction of housing projects.

Section 23 Leased Public Housing

LHAs lease existing or newly constructed rental units from owners at market rental rates and then sublease units to low income households at reduced rents. A theoretical advantage of this program is that it allows a more dispersed pattern of subsidized households, since they can occupy housing projects also occupied by nonsubsidized households.

Section 221(d)(3) (12 USC 17151)

Loans with below-market-interest-rates of 3 percent are made to profit and non-profit sponsors. The 3 percent loan enables monthly rents to be greatly reduced. Household income levels are comparable to those for Sections 235 and 236 for small households but are higher for larger households.

Section 235 (12 USC 1715z)

This is the first major housing program designed to subsidize low and moderate income households in purchasing a home. An interest subsidy technique is employed in which the home buyer's payments are reduced to those which would be paid on a mortgage with a 1 percent interest rate. The federal government pays the difference between the prevailing interest rate and the 1 percent rate. Households must pay at least 20 percent of their income to pay off the mortgage. The 20 percent of income rule is 5 percent less than that operating under rental programs. The rationale for this is that home owning incurs considerable additional maintenance expenses not covered in the mortgage payments. Family income limits are based on 135 percent of those of public housing.

Section 236 (12 USC 1715z-1)

This rental program employs a 1 percent interest subsidy technique comparable to that utilized in the 235 program. This permits rents to be reduced to the level achievable had the project been financed with a 1 percent mortgage. Tenants pay a maximum of 25 percent of their income toward rent, the federal government paying the difference. Family income limits are 135 percent of those of public housing.

Experimental Housing Allowance Program (EHAP)

Transfer payments from the federal government are made to low income households which permit them to bid in the private market for housing they otherwise could not afford. Theoretically, any existing housing unit can be used; however, landlords can, in fact, avoid participation in the program. Jacksonville was selected as one of several cities to test this demand-side housing subsidy approach. The EHAP units

evaluated in this study represent a first round experimentation of the program. Local HUD officials admit to several shortcomings, such as lack of adequate screening and counseling of applicants. A second round experimentation is now in progress.

Elderly Programs

The elderly housing units are provided under the public housing, Section 202 (12 USC 1701q) which was designed specifically for elderly households, and Section 236 programs. Since the projects were occupied solely by elderly, a single elderly category was considered.

Although all non-rural, low income housing programs, except the Section 8 program (42 USC 1437f), are being gradually phased out by the Housing and Community Development Act of 1974, existing and future housing programs should be evaluated as to the locational subsidy and racial equality they provide.

Data on the location, number of subsidized units and racial occupancy were obtained from various agencies in Jacksonville. The local and regional HUD offices, the Community Renewal Program (CRP, now renamed the Neighborhood Improvement Mechanism, NIM), and the Experimental Housing Allowance Program (EHAP) offices were generous in providing information. Yearly tenant occupancy forms by housing project were made available by the regional HUD office (for the 202, 221(d)(3), and 236 programs) and the local HUD office (for public housing, 23 leased housing, and the EHAP programs). Racial occupancy figures for the Section 235 program could not be obtained.

Since the availability of the tenant occupancy forms prior to 1972 was erratic and the 235 and 236 programs enacted in 1968 had not been sufficiently utilized, 1972 was selected as the year to compare housing

programs. This difference of two years was again considered permissible, since census tract socioeconomic characteristics are not likely to change drastically in a two-year period. A comparison of 1972, 1973 and 1974 tenant occupancy figures for each project revealed only slight changes in the racial occupancy pattern (almost always less than 5 percent) for any individual housing project. In certain instances, it became necessary to use 1973 or 1974 tenant occupancy figures for certain housing programs and for individual housing projects in other programs.

Having utilized the tenant occupancy records, it is appropriate to report the inconsistent quality and apparent reporting inaccuracy of these data (the comparison of three years helped alleviate this problem). Some persons who had completed the forms obviously had given considerable attention to detail while others had not. In making detailed comparisons between individual housing projects, these data may present reliability problems. For the more general housing program comparisons sought in this research, however, the data appear acceptable.

Methodology

In order to assess the impact of the spatial allocation of various housing programs on the housing subsidy level and racial equality, it was necessary to develop a methodology designed to: (1) assign a socioeconomic score which adequately reflects the relative socioeconomic suitability of census tracts and which can be used to measure the locational subsidy; (2) test whether various housing programs locate in census tract providing significantly different locational and housing subsidies; and (3) test whether white and minority occupied housing units within each housing program locate in census tracts providing significantly different locational and housing subsidies.

Principal components analysis was selected as an appropriate statistical technique to accomplish the development of the socioeconomic surface from the twenty variables. This technique was chosen for two reasons. First, it was used to achieve data reduction and second, it was felt that extracted components would provide measures by which census tracts could be ranked from lower to higher quality socioeconomic environments (environments offering from lower to higher locational subsidies).

Principal components analysis extracts the underlying dimensions of the original twenty variables and displays them initially in the unrotated factor matrix. These dimensions are represented by a smaller number of components which account for a large percentage of the total variance in the data set; this achieves data reduction. The first unrotated component accounts for the largest percentage of total variance, with each subsequent component accounting for the next largest percentage of total variance.

"There is no way to exercise control over the initial location of the factor-axis in the configuration of vectors" (Rummel, 1970, p. 375). Vectors are axes which depict the values of a variable for all cases (census tracts) considered. Due to this characteristic of the unrotated components, the varimax rotation was deemed appropriate for the purpose of this study (Rummel, 1970, p. 392). The varimax criterion rotates the components to a position in component space in which variable loadings (correlations with components) are maximized on individual components, thus maximizing the variance between components.

There are "rules of thumb" which have guided the decision of how many components to rotate. It is pointless to rotate components

accounting for only a small portion of total variance, since an individual variable is likely to account for more total variance. Components with eigenvalues greater than 1 or those accounting for at least 5 percent of the total variance are two such "rules of thumb." They happen to be the same when twenty variables are used.* Rotated components account for the same percentage of total variance as the unrotated components, although each component's percentage of total variance can change.

For rotated components a component score (the standard score of each census tract on each component) was obtained. The component score indicates a census tract's relative performance on the component, with positive component scores representing more favorable and negative component scores representing less favorable than average census tract performance on a component.

In developing a composite socioeconomic score for each census tract from each tract's performance on the components, the problem of weighting was encountered. As mentioned earlier, the assumption was made that each variable was of equal importance. However, the principal components technique, in a sense, weights certain variables as being more important, since variables loading high on the more important components contribute more significantly to a census tract's relative performance on a component. It does not seem reasonable to treat a census tract's component scores on two components, one accounting for twice the total variance of the other, the same. Unfortunately, there is less guidance

*Totaling the eigenvalues for all components equals the number of variables in the data set. In the case of twenty variables being used, an eigenvalue of 1 also means a component accounts for 5 percent of the total variance.

in the factor and principal components analysis literature to assist in resolving the weighting problem. The decision invariably rests on an informed decision of the researcher, based on specific reasons for using principal components analysis.

A work by Chang (1971) provided some guidance and cautions concerning the weighting problem. Her dissertation experimented with various weighting schemes for factor analyses of the fifty states and sixty-seven counties in Florida. Weighting by the percentage of total variance explained was found most appropriate for the situations studied:

In most research, however, it would seem that if one is to use factor scores, some weighting criterion other than unit weights should be used, probably most often percentage of variance accounted for. This most nearly reproduces the results obtained by use of raw scores. (Chang, 1971, p. 67)

A caution related to the weighting of component scores was provided:

The biggest criticism for the use of factor scores, no matter what weighting is used, is the loss of information that results. Variance on individual variables is valuable in grouping cases. As has been pointed out before, cases with similar factor scores have differences in levels of individual variables which can be capitalized on in grouping. One is never justified in using factor scores indiscriminantly. Only when the alternatives are carefully weighed and the limitations of each considered, should one use factor scores in preference to raw scores. (Chang, 1971, p. 68)

When census tract performances on individual components are compared, weighting is not an issue; however, in developing a composite socioeconomic score by combining information contained in the rotated components weighting is an important consideration. Using the percentage of variance accounted for as a weighting procedure places greater emphasis on a census tract's performance on a component accounting for a greater percentage of the total variance. Given the dual goals of data

reduction and developing a socioeconomic score which measures the relative socioeconomic suitability of census tracts, the percentage of variance explained weighting procedure was employed.

Multiplying component scores for each census tract by the square root of each component's eigenvalue accomplished the weighting procedure. Just as the unweighted component scores, these weighted values indicate census tracts ranging from less suitable to more suitable performances on the components. Adding these weighted values for each component for each census tract produced a composite socioeconomic score for each census tract which incorporates a tract's performance on all three components. These scores for each census tract on each component and on the composite socioeconomic score were indexed so that the highest negative score would be equal to 1 and the highest positive score equal to 1,000. Values between these two extremes were converted to their appropriate index score. The resulting index scores should approximate a continuum of ninety census tracts with socioeconomic environments ranging from least suitable to most suitable on each component and for the composite socioeconomic score.* The composite score is hereafter referred to as the socioeconomic score and it was used as a surrogate measure of the locational subsidy in evaluating the various housing programs. Census tracts with higher socioeconomic scores were assumed to provide higher locational and housing subsidies.

To compare the spatial allocation patterns of the various housing programs the number of housing units in a census tract for each housing

*Appendix A provides equations for the calculation of the composite socioeconomic score and index score. Table A-1 compares the results of unweighted and variance weighted component score techniques.

program was multiplied by the socioeconomic score for that census tract. The resulting products were summed for each census tract in which a particular housing program's units were located and this figure was divided by the total number of housing units in the program. This yielded an average socioeconomic score for census tracts in which a particular housing program was located. Average socioeconomic scores for various housing programs can be compared, but because these averages result from skewed data, a parametric technique was not employed. Chi-square tests of independence were performed to determine if the differences between housing programs were statistically significant. Three or four socioeconomic score categories were utilized and each pair of housing programs compared. Calculated Chi-square values exceeding the appropriate tabular value will lead to rejection of the null hypothesis of no difference between housing programs and the socioeconomic suitability of census tracts in which they were located.

In a similar manner, the number of white and minority occupied housing units for each housing program were multiplied by the census tract's socioeconomic score, summed for all tracts in which they were located and divided by the total number of white and minority occupied units. These two average socioeconomic scores will indicate the relative suitability of socioeconomic environments in which white and minority subsidized households are being located. Chi-square tests of independence with calculated values exceeding the appropriate tabular value will lead to rejection of the null hypothesis of no difference between white and minority households and the socioeconomic suitability of census tracts in which they were located (or the housing subsidy levels realized by white and minority households).

CHAPTER IV

THE SOCIOECONOMIC SURFACE FOR JACKSONVILLE

In this chapter the results of the principal components analysis are detailed and the development of the census tract socioeconomic scores which are used as the surrogate measures of the locational subsidy in subsequent chapters is presented. Maps depicting the socioeconomic score surface and the three component surfaces for Jacksonville's ninety census tracts are also provided.

The Three Rotated Components

In the unrotated matrix, three components accounted for 79 percent of the total variance in the data set, with components I, II and III accounting for 60 percent, 12 percent, and 7 percent respectively.* The varimax rotation of these components retained the 79 percent of total variance but each component's percentage of total variance explained changed to 36 percent, 25 percent, and 18 percent respectively. Table 2 lists those variables with loadings (correlation coefficients) of .50 or more (+ or -) on the three rotated components.** Six variables loaded on more than one component while one variable, age-adjusted death rate, did not have a .50 or higher (+ or -) loading on any rotated component (it had its highest loading of -.46 on Component I).

*Only components with eigenvalues of 1 or more were rotated.

**If possible, all variables were normalized. This was necessary so that component scores would be normally distributed. This facilitated the use of the variance weighted component score technique used to derive the socioeconomic score. Appendix B lists the transformations required to normalize each variable.

Table 2

Variable Loadings on Rotated Components

Correlation Coefficient	Variable Identification Number	Variable Description
Component I - Housing, Income and Education Component:		
-.936	11	Units with plumbing but 1.01 or more persons per room
+.853	13	Units with air conditioning
+.844	5	Mean family income/average number of persons per household
+.829	16	Composite sixth grade test scores
+.795	14	High school graduates
-.682	7	Population below poverty level
+.672	8	Median home value
+.633	9	Median gross rent
-.583	19	Violent crime rate per 100,000 population
-.576	10	Units lacking plumbing
-.548	6	Labor force unemployed
-.544	15	Persons 16-21 years old not in high school or enrolled
-.500	4	Occupied units without automobile
Component II - Household Component:		
-.898	12	Rental units for which households pay in excess of 25 percent of income
+.852	1	Units owner-occupied
-.812	2	Female-headed households
-.769	3	Households divorced or separated of those married
-.704	4	Occupied units without automobile
-.587	7	Population below poverty level
-.569	6	Labor force unemployed
Component III - Crime Component:		
-.864	18	Part II crime rate per 100,000 population
-.804	17	Part I crime rate per 100,000 population
-.650	15	Persons 16-21 years old not in high school or enrolled
-.575	19	Violent crime rate per 100,000 population
-.502	10	Units lacking plumbing

Source: Compiled by author.

The naming of components was facilitated by the types of variables which loaded heavily on them. Thirteen variables loaded (+ or - .50 or higher) on Component I. Since eleven of these thirteen variables represent the housing, income and education characteristics, Component I is called the Housing, Income and Education Component.

Four of the first five variables loading on Component II represent household characteristics; therefore, it is called the Household Component. Although the percentage of rental units for which households pay in excess of 25 percent of their income has the highest loading on Component II, this appears to be explained by the high positive loading of percentage of units owner occupied.

Since three of the five variables loading heavily on it are the three crime rates, Component III is named the Crime Component.

Components I and II correspond with the socioeconomic and life-cycle factors cited in numerous factorial ecology studies of cities (for example, see Economic Geography, Volume 47, No. 2 (Supplement), July, 1971). A third factor reflecting ethnic characteristics often uncovered in these studies was not possible in this study, since racial and ethnic variables were intentionally excluded for the reasons given in Chapter II.

The Socioeconomic Score

To derive the socioeconomic score, the square root of each rotated component's eigenvalue was multiplied by each census tract's component score. These three weighted component scores were indexed so that the poorest performing tract's score would equal 1 and the best

performing tract's score would equal 1000. These index scores indicate the relative performance of the ninety census tracts on each component and are provided in Table 3. The addition of the weighted component scores for each census tract produced the socioeconomic scores which were indexed from 1 to 1000 to yield the relative performance of each census tract when all three components are simultaneously considered. A census tract's socioeconomic score was used as a surrogate measure of the tract's locational subsidy in evaluating housing programs.

Figure 4 demonstrates the apparent success of the employment of the principal components analysis and the addition of variance weighted component scores in generating socioeconomic scores for census tracts which produce a continuum of socioeconomic environments, ranging from least to most suitable. In order to illustrate the intuitive appeal of using the socioeconomic score as an appropriate measure of the locational subsidy, the first and every fifteenth census tract from the array in Table 3 were selected and their performance on the original twenty variables displayed in Table 4. The socioeconomic score appears in parentheses next to the census tract's identification number; the identification numbers for the ninety census are indicated in Figure 5.

Table 4 reveals that as the socioeconomic score of a census tract increases, a tract's performance on the favorable variables tends to increase while its performance on the unfavorable variables tends to decrease. There are instances, however, when the expected trends on individual variables are not the case. For example, census tract 159

Table 3

Index Socioeconomic and Component Scores by Census Tract

Census Tract	Socio-economic Score	Component Scores			Census Tract	Socio-economic Score	Component Scores		
		I	II	III			I	II	III
18	1	418	18	130	21	546	838	182	564
17	10	122	13	520	144	546	401	526	615
10	62	575	70	1	162	546	633	466	419
5	86	177	171	395	168	560	377	587	590
19	143	510	45	289	154	564	684	370	527
11	148	470	277	25	157	564	830	330	405
4	151	180	191	504	109	569	474	568	518
12	157	545	165	109	127	571	412	642	493
16	166	90	1	911	102	571	471	667	387
115	173	53	273	660	23	572	784	345	459
26	177	235	270	383	123	590	637	349	669
15	178	325	139	457	124	603	618	382	675
2	207	55	290	638	135	613	573	424	692
13	261	461	186	405	159	620	639	511	506
28	265	116	214	793	133	620	771	281	666
29	269	123	208	804	161	622	746	396	539
163	325	345	407	375	153	630	867	204	678
116	325	1	322	913	152	631	744	275	730
121	364	500	463	192	126	633	631	389	715
107	366	75	432	756	112	639	583	549	562
3	376	376	501	316	104	646	530	616	547
14	383	597	414	182	148	649	915	81	833
27	389	335	469	438	120	650	573	584	548
8	396	998	145	98	111	651	604	473	667
20	406	631	155	554	125	661	830	308	648
113	409	214	360	780	164	666	694	292	843
118	416	490	562	177	167	668	664	605	448
155	428	609	335	373	22	669	740	284	805
117	433	282	591	425	128	674	508	503	792
6	452	719	278	395	145	679	509	660	583
114	460	61	415	1000	7	684	759	298	796
122	460	583	347	458	131	685	735	326	787
105	462	336	587	429	146	691	739	600	414
106	467	198	637	538	156	705	882	429	508
1	469	540	439	404	151	709	664	389	838
103	470	349	703	269	160	715	776	468	603
119	472	338	564	478	24	745	942	346	653
139	490	480	238	800	166	747	866	365	706
143	506	436	470	565	129	760	603	537	815
137	507	220	515	752	158	790	783	428	811
101	509	332	648	450	149	795	664	457	917
110	521	459	561	441	150	851	853	449	830
25	528	592	389	536	165	891	957	455	780
108	529	101	663	753	147	903	687	1000	373
134	542	566	393	591	130	1000	1000	463	973

Source: Compiled by author.

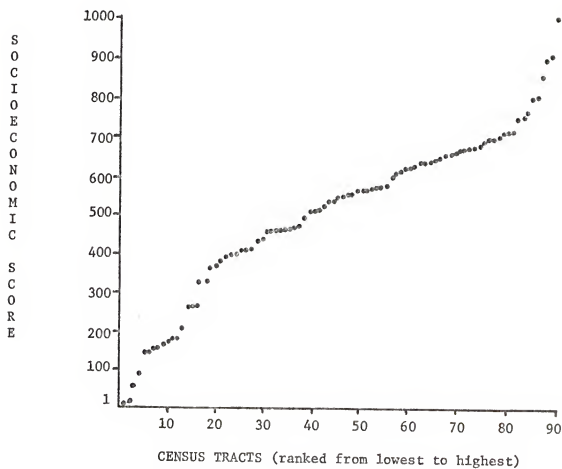


Figure 4
Socioeconomic Scores by Census Tract

Table 4

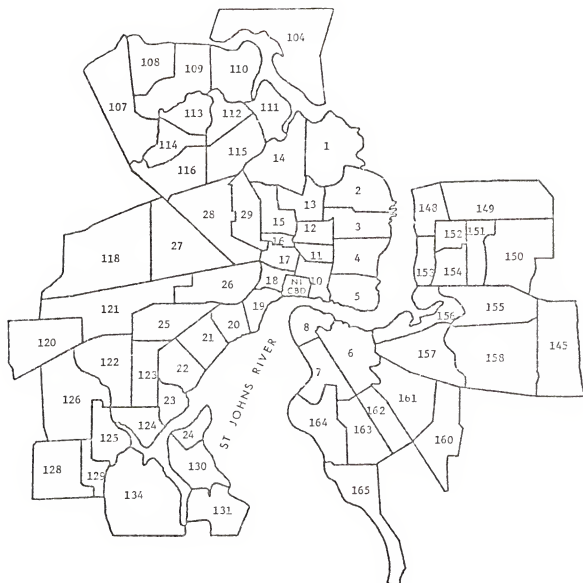
Performance of Every 15th Ranked Census Tract
by Socioeconomic Score on Twenty Original Variables

Characteristics and Variables	18(1)*	28(265)*
Household:		
1. Units owner-occupied	6.8	59.8
2. Female-headed households (%)	38.9	27.2
3. Households divorced or separated of those married (%)	46.9	21.3
4. Occupied units without automobile (%)	77.1	40.4
Economic:		
5. Mean family income/average number of persons per household	\$1,730	\$1,697
6. Labor force unemployed (%)	7.25	5.43
7. Population below poverty level (%)	51.10	37.00
8. Median home value	\$6,800	\$8,600
9. Median gross rent	\$ 71	\$ 85
Housing:		
10. Units lacking plumbing (%)	52.1	8.4
11. Units with plumbing but 1.01 or more persons per room (%)	9.4	16.5
12. Rental units for which households pay in excess of 25 percent of income (%)	53.5	18.3
13. Units with air conditioning (%)	3.2	18.7
Education:		
14. High school graduates (% over 25 years old)	19.5	33.3
15. Persons 16-21 years old not in high school or enrolled (%)	29.9	16.1
16. Composite sixth grade test scores	627	618
Crime:		
17. Part I crime rate per 100,000 population	27,029	6,988
18. Part II crime rate per 100,000 population	7,955	2,507
19. Violent crime rate per 100,000 population	9,663	1,498
Health:		
20. Age-adjusted death rate	10.17	10.33

*The first number is the census tract's identification number; the number in parentheses is the tract's socioeconomic score.

Table 4 - extended

6(452)*	134(542)*	159(620)*	145(679)*	130(1,000)*
64.3	54.5	81.2	87.6	93.0
18.2	9.3	8.2	8.5	5.7
17.6	7.3	7.0	6.3	2.7
16.4	5.2	3.5	1.4	1.9
\$4,153	\$2,878	\$3,321	\$3,181	\$7,648
3.15	2.43	3.86	1.70	1.31
15.60	10.10	8.20	3.90	4.10
\$11,400	\$10,800	\$13,800	\$10,400	\$34,100
\$ 102	\$ 119	\$ 138	\$ 109	\$ 238
2.9	1.2	1.4	0	0
5.9	7.0	5.0	5.3	1.1
12.1	18.9	4.7	1.2	2.0
68.6	63.0	72.2	61.4	96.5
54.8	55.2	64.7	49.7	91.5
10.1	17.6	19.2	12.0	.1
960	939	1,112	830	1,293
12,218	6,147	5,214	5,057	3,133
4,245	2,653	3,427	2,451	1,222
922	390	483	341	139
5.26	10.47	7.70	6.44	9.84



NI = Not Included

CBD = Central Business District

Figure 5

Identification Numbers for Census Tracts in Jacksonville

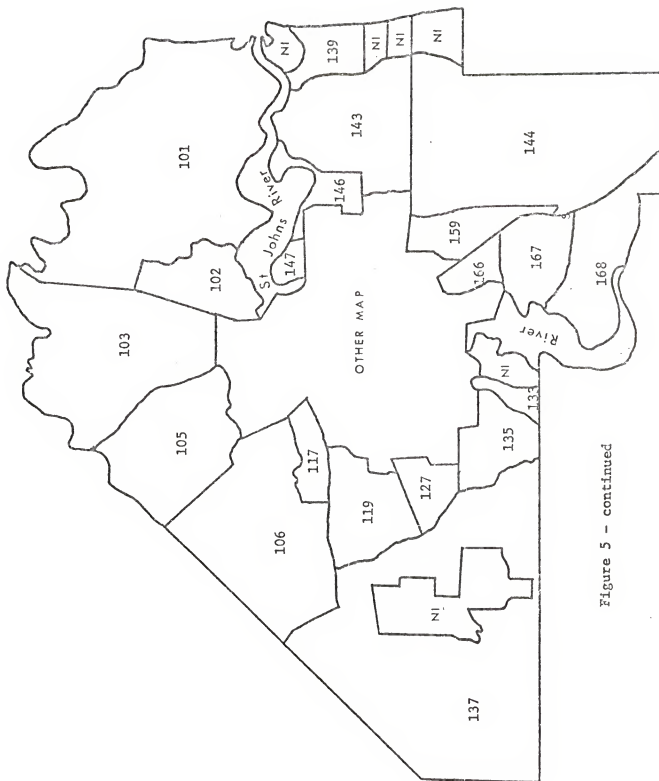


Figure 5 - continued

with a socioeconomic score of 620 has a lower per capita income and a higher percentage of persons 16 to 21 years old not in high school or enrolled than census tract 6 with a lower socioeconomic score of 452. Census tract 159, however, performs more favorably on most other variables. It has a higher educational test score, more favorable household characteristics, and considerably lower crime rates than census tract 6. Table 5 shows that, although census tract 6 has the second best performance of the seven compared tracts on the most important first component, its low performance on the other two components allows census tracts performing less favorably on Component I to surpass it in terms of the socioeconomic score. The ability of the principal components analysis technique to simultaneously consider many important variables and reduce them to meaningful components which permit census tracts to be evaluated as to their relative socioeconomic suitability appears substantiated.

Component and Socioeconomic Score Surfaces

Figures 6 through 9 depict the three component surfaces and the socioeconomic surface for Jacksonville by dividing the ninety census tracts into quintiles representing from lower to higher performing census tracts on each component and on the socioeconomic score.

On Component I, the Housing, Income and Education Component, the lower performing census tracts radiate primarily northwest of the Central Business District (CBD). Figure 6 shows that higher performing census tracts border the St. John River on the east and west, south of the CBD. Generally, movement away from the river in either direction is accompanied by a decrease in census tract performance on this component, although this trend is less pronounced east of the river.

Table 5

Index Values on Rotated Components and Composite Socioeconomic Score

Composite Score Rank	Census Tract Number	Component I	Component II	Component III	Composite Socioeconomic Score
1	18	418	18	130	1
15	28	116	214	793	265
30	6	719	278	395	452
45	134	566	393	591	542
60	159	639	511	506	620
75	145	509	660	583	679
90	130	1000	463	973	1000

Source: Compiled by author.

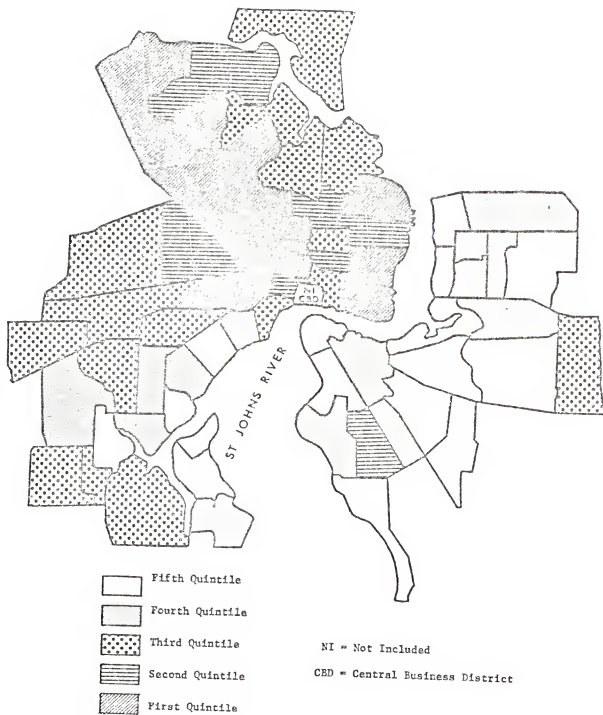


Figure 6
Housing, Income and Education Component

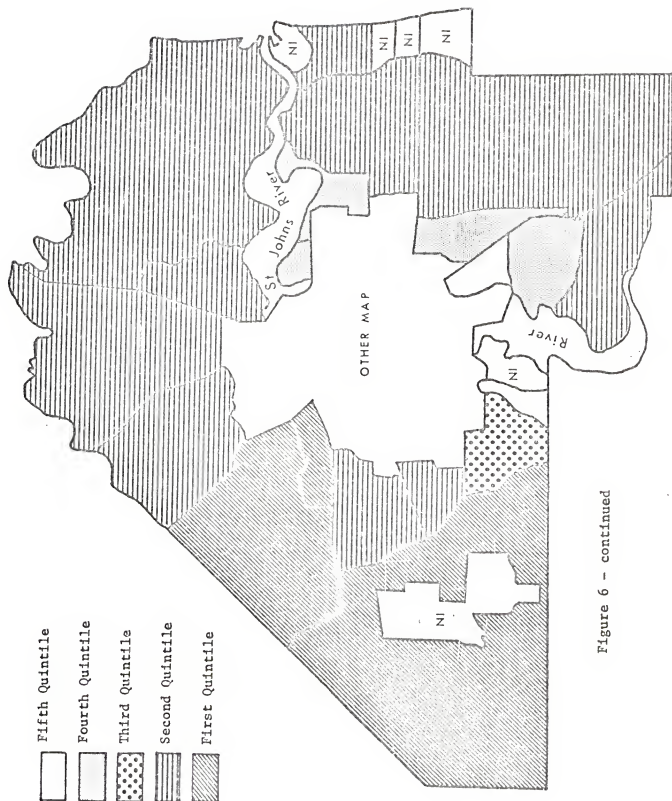


Figure 6 - continued

Figure 7 indicates that Component II, the Household Component, appears to be related generally to distance from the CBD, with census tracts closer to the CBD performing less favorably than census tracts more distant.

The Crime Component or Component III in Figure 8 displays a less discernible pattern than the other two components. Some census tracts perform quite favorably or have lower crime rates while performing rather unfavorably on the other two components.

The socioeconomic score map in Figure 9 depicts the central city census tracts as providing the lower scores. Only one census tract (163) in the lowest quintile is located south and east of the St. Johns River. Higher scores are noted for census tracts bordering the river, except for those census tracts directly northeast and southwest of the CBD. It is assumed that census tracts in the lighter categories or higher quintiles on the socioeconomic score map provide higher locational and housing subsidies while the darker tracts provide less favorable locational and housing subsidies. Figure 10 depicts this assumed relationship between census tracts' socioeconomic scores and the locational subsidies (LS1, LS2 and LS3) and housing subsidies (HS1, HS2 and HS3) attainable under housing programs in which a fixed housing structure subsidy (HSS1) is also assumed.

Conclusions

Given the assumptions guiding this research, census tracts affording higher locational and housing subsidies have been identified. Ceteris paribus, subsidized households located in census tracts with higher socioeconomic scores are subsidized to higher levels than households located in census tracts with lower socioeconomic scores. If housing

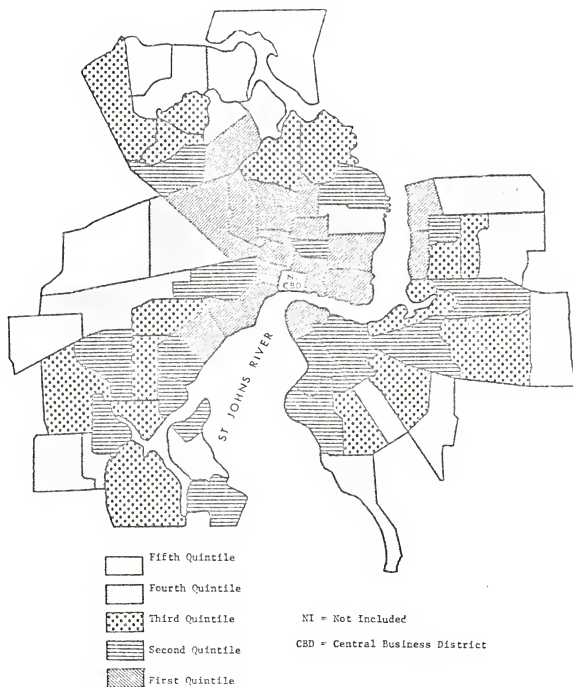


Figure 7
 Household Component

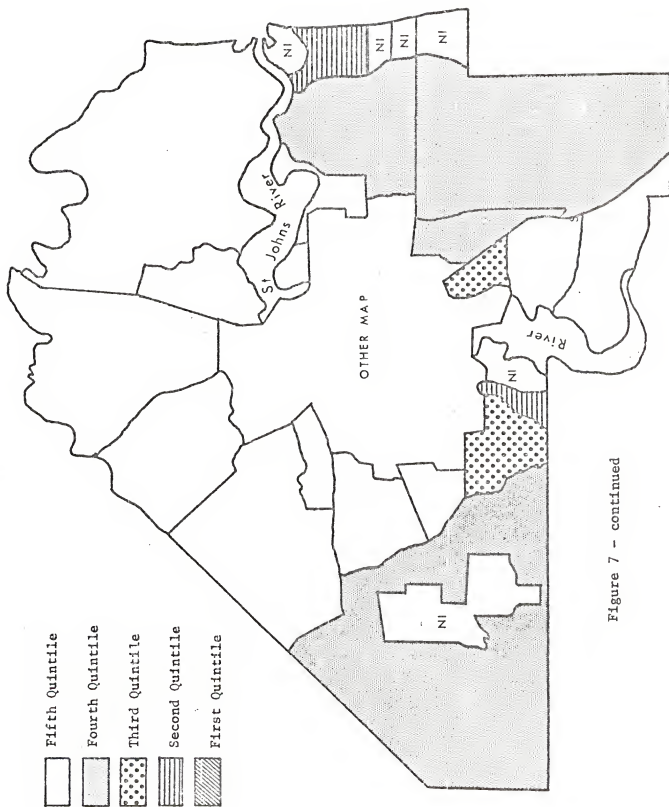


Figure 7 - continued

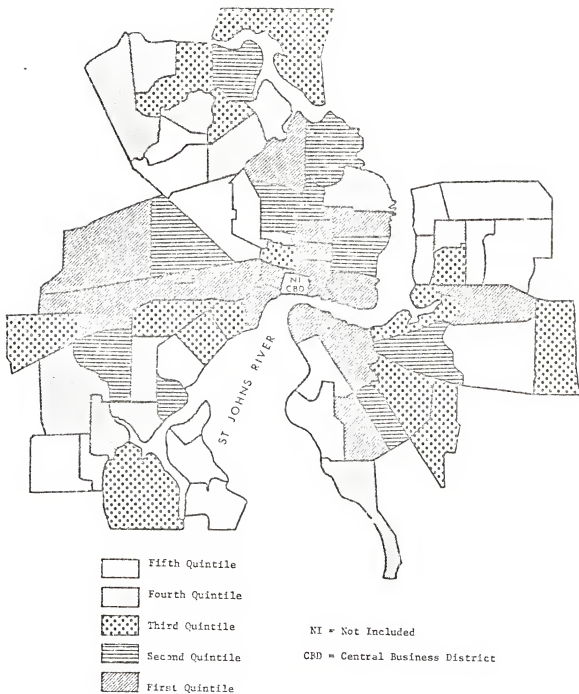


Figure 8
Crime Component

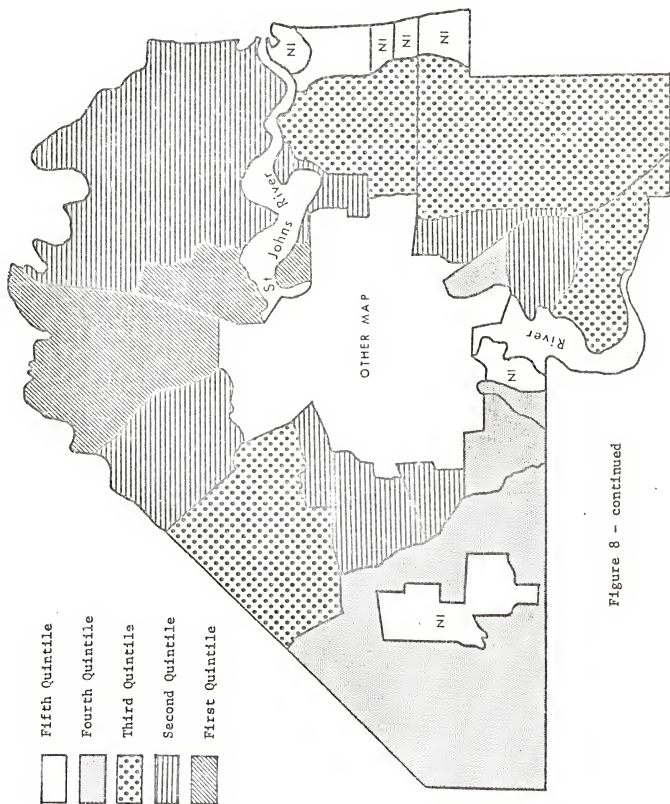


Figure 8 - continued

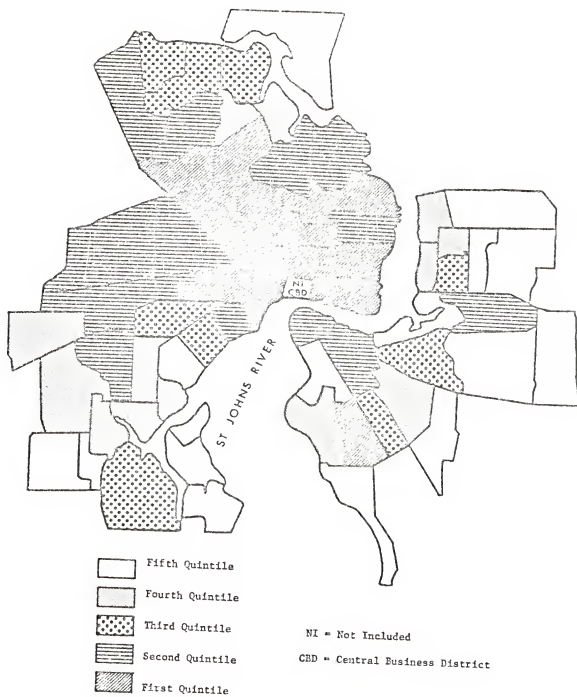


Figure 9
Socioeconomic Score

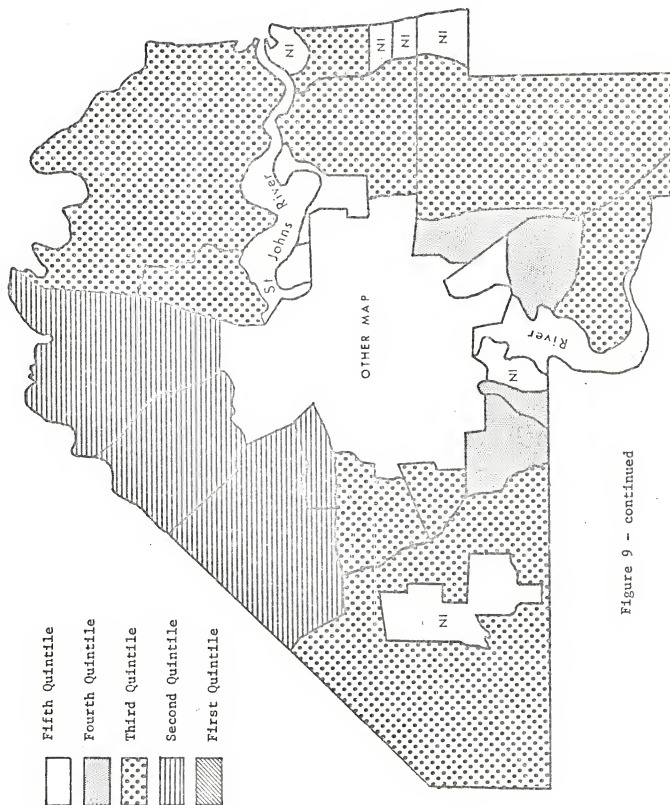
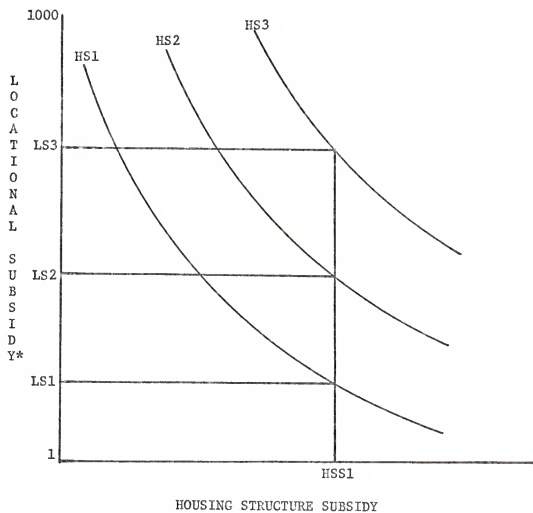


Figure 9 - continued



* Measured by the socioeconomic score.

Figure 10
Assumed Relationship Between Socioeconomic Score
and the Locational and Housing Subsidies

units within or between housing programs are located at significantly lower or higher socioeconomic elevations (in census tracts with lower or higher socioeconomic scores), then households are being subsidized at significantly lower or higher housing subsidy levels. Similarly, if one racial group is consistently located at significantly higher socioeconomic elevations than another racial group, then it would appear that socioeconomic inequality based on race is being perpetuated through locational policies or practices which tend to locate households of a certain racial group in more favorable locational subsidy areas. It is also assumed that census tracts with higher socioeconomic scores are more able to absorb the social costs generated by the location of subsidized households while still maintaining a suitable socioeconomic environment.

CHAPTER V

HOUSING PROGRAMS AND LOCATIONAL SUBSIDIES

The objective of this chapter is to determine whether or not the housing units provided by seven federally subsidized housing programs are located in significantly different socioeconomic environments. If housing units provided by the various housing programs are located in significantly different socioeconomic environments, it will be concluded that housing programs are also providing significantly different locational subsidies. Locational and housing subsidy differentials within each housing program will also be compared.

A Comparison of Locational and Housing Subsidies between Housing Programs

Table 6 lists the seven housing programs, the number of occupied housing units in each, and the average socioeconomic scores of the census tracts in which the respective housing program units are located. This average is weighted by the number of housing units in each census tract. The Section 236 housing program units are located, on average, in census tracts with socioeconomic scores 132 points higher than the next highest housing program, the Section 23 leased housing program. Public housing units are located in the lowest socioeconomic environments which, on average, are 321 points lower than the Section 236 program. Table 7 provides the percentage of housing units for each housing program by socioeconomic score categories of census tracts in which they are located.

Table 6
Number of Housing Units and Average
Socioeconomic Score by Housing Program

Housing Program	Number of Units	Average Socioeconomic Score
Public Housing	2,115	271
23 Leased Housing	451	460
Section 221(d) (3)	2,160	347
Section 235	2,290	433
Section 236	1,386	592
EHAP	269	397
Elderly*	1,861	352
Total	10,532	390

*These units are provided under various programs but serve only elderly households.

Source: Compiled by author.

Table 7
Percentage of Units by Socioeconomic Score Category

Housing Program	Socioeconomic Score			
	1 to 199	200 to 399	400 to 599	600 and over
Public Housing	30.5	49.5	.5	19.5
23 Leased Housing	4.0	28.2	47.4	20.4
Section 221(d)(3)	24.6	28.1	47.2	0
Section 235	7.1	36.2	42.5	14.2
Section 236	1.2	0	43.3	55.5
EHAP	19.3	33.8	30.5	16.4
Elderly	36.4	31.8	9.7	22.1
TOTAL	20.0	31.3	29.3	19.5

Source: Compiled by author.

Although considerable differences in average socioeconomic scores between programs are indicated, Chi-square tests of independence between each possible pairing of housing programs by socioeconomic score categories were conducted. Twenty-one comparisons were performed and the calculated Chi-square values are supplied in Table 8. For twenty of the program comparisons rejection of the null hypothesis is indicated. Significant differences do exist between pairs of housing programs and the socioeconomic score of census tracts in which their respective housing units are located. Only the Section 221(d)(3) and EHAP programs are statistically similar in the location of households, although there is an actual difference of 51 points between their average socioeconomic scores.*

It is noted that the demand-side EHAP program housing units achieve an average socioeconomic score higher than three of the six supply-side programs, public housing, 221(d)(3), and elderly, but lower than the other three programs, the Sections 23, 235 and 236 programs. This indicates that, despite any other advantages the demand-side EHAP program may possess, it does not necessarily lead to subsidized households being located in higher socioeconomic environments when compared with all

*The lack of a significant difference in this comparison could have resulted from the fact that no census tracts in which Section 221(d)(3) units were located had socioeconomic scores greater than 500. The EHAP program, on the other hand, had 35 percent of its housing units located in census tracts with socioeconomic scores in excess of 500. The problem of zeros appearing in the Chi-square table cells necessitated using just a 400 and over category when comparing the Section 221(d)(3) with other housing programs instead of the more typical 400 to 599 and 600 and over categories utilized in other comparisons.

Table 8

Chi-Square Values Comparing Housing Programs
by Socioeconomic Score Categories of Census
Tracts in Which Their Units Are Located

Housing Program	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) Public Housing	1,109.4	374.8	1,261.5	2,269.6	138.9	260.6	
(2) 23 Leased Housing		106.7	23.8	455.9	56.0	431.9	
(3) Section 221(d)(3)			260.3	608.0	5.3*	109.6	
(4) Section 235				1,049.2	50.1	874.4	
(5) Section 236					707.5	1,515.8	
(6) EHAP						55.9	
(7) Elderly							

*Only value not significant at .01 level (3 df. = 11.3449 and 2 df. = 9.2103).

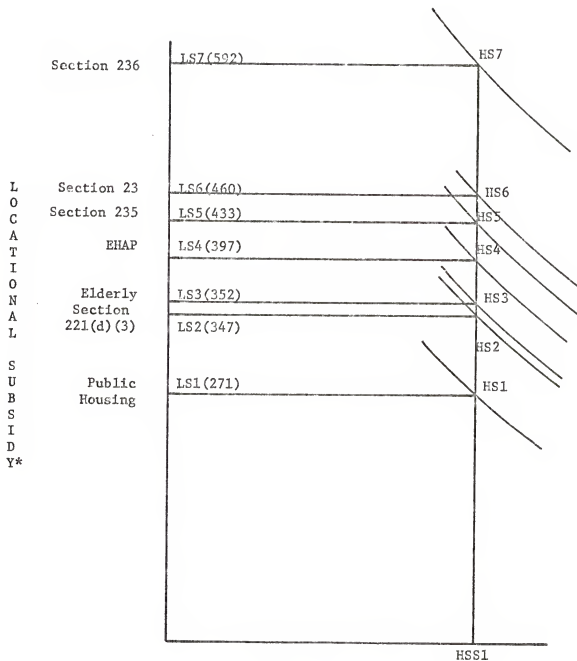
Note: The socioeconomic score categories were 1 to 199, 200 to 399, 400 to 599, and 600 and over, except when zero values appeared in a cell for one of the housing programs, in which case three categories were used.

Source: Compiled by author.

supply-side housing programs. In fact, the more recent Sections 235 and 236 programs have achieved average socioeconomic scores higher than the EHAP program in Jacksonville.

The extremely high Chi-square values in the twenty housing program comparisons diminish the likelihood of the null hypothesis being rejected by chance or merely because of the socioeconomic categories selected. It must be concluded that various housing programs tend to locate their housing units and, therefore, their subsidized households in significantly different socioeconomic environments or in census tracts affording significantly different locational subsidies.

Using each program's average socioeconomic score to measure the magnitude of the locational subsidy provided and expanding on the theoretical assumption made in Chapter II, Figure 2 (but dropping the technical constraint or HSF), it is possible to graph the implications of this differential location. Figure 11 depicts the total housing subsidies (HS1 to HS7) produced by the different locational subsidies (LS1 to LS7) provided by the seven housing programs. It is also assumed that each housing program provides a similar housing structure subsidy (HSS1). The principal components analysis and the development of the socioeconomic score for census tracts accomplished in Chapter IV permits the vertical locational subsidy axis in Figure 2 to be replaced and approximated by the average socioeconomic score of census tracts in which an individual program's housing units are located. Although the assumption of similar housing structure subsidies for all programs may not be realized, it yields an effective graphic representation of the locational subsidy's impact on the total housing subsidy, as well as illustrating how a household's housing subsidy may be influenced by the housing program it qualifies for.



* Measured by average socioeconomic score.

Figure 11

Locational and Housing Subsidies Provided by Various Housing Programs

On average, households in public housing units receive the smallest housing subsidy (HS1) while those households in Section 236 projects receive the highest (HS7). Households qualifying for the public housing program are usually the poorest of subsidized households (the maximum income limits are lower) and presumably in need of the greatest housing subsidies (Solomon, 1974), yet Figure 11 indicates they receive the lowest locational and housing subsidies.

A Comparison of Locational and Housing Subsidies within Housing Programs

Employing the same assumptions as those depicted in Figure 11 and given the different socioeconomic scores achieved under each housing program in Tables 9 through 15, it can be graphically demonstrated that there is considerable variation in the locational subsidies and housing subsidies provided under each housing program. Certain households are being located in more favorable socioeconomic environments and receive housing subsidies greater than similar households located in less favorable socioeconomic environments. Assuming similar housing structure subsidies (HSS1) within each program, Figure 12 indicates the lowest and highest locational subsidies (LS1 and LSh) and housing subsidies (HS1 and HSh) achieved under each program.

Before drawing conclusions regarding the importance of the magnitude of the difference between the lowest and highest locational subsidies provided under a specific housing program, several aspects of the problem must be considered. The percentage of a program's housing units located in census tracts providing lower or higher locational subsidies is an important consideration. Tables 9 through 15 indicate that from a high of 30.5 percent of the public housing units to a low of

Table 9
Public Housing: Socioeconomic Scores and
Number of Housing Units by Census Tract

(1) Census Tract	(2) Socioeconomic Score	(3) Number of Housing Units	(2)x(3)
17	10	645	6,540
13	261	571	149,031
29	269	270	72,630
14	383	207	79,281
137	507	10	5,070
159	620	230	142,600
120	650	<u>182</u>	<u>118,300</u>
All Census Tracts		2,115	573,362
Average Socioeconomic Score	271		

Source: Compiled by author.

Table 10

Section 23 Leased Housing: Socioeconomic Scores
and Number of Housing Units by Census Tract

(1) Census Tract	(2) Socioeconomic Score	(3) Number of Housing Units	(2)x(3)
12	157	18	2,826
2	207	52	10,764
28	265	75	19,875
1	469	52	24,388
127	571	162	92,502
161	622	<u>92</u>	<u>57,224</u>
All Census Tracts		451	207,579
Average Socioeconomic Score	460		

Source: Compiled by author.

Table 11

Section 221(d)(3): Socioeconomic Scores and
Number of Housing Units by Census Tract

(1) Census Tract	(2) Socioeconomic Score	(3) Number of Housing Units	(2)×(3)
4	151	156	23,556
115	173	200	34,600
26	177	176	31,152
28	265	76	20,140
116	325	260	84,500
163	325	200	65,000
27	389	72	28,008
20	406	46	18,676
155	428	200	85,600
6	452	74	33,448
114	460	200	92,000
122	460	400	184,000
139	490	<u>100</u>	<u>49,000</u>
All Census Tracts		2,160	749,680
Average Socioeconomic Score	347		

Source: Compiled by author.

Table 12

Section 235: Socioeconomic Scores and
Number of Housing Units by Census Tract

(1)	(2)	(3)		(1)	(2)	(3)	(2)x(3)
Census Tract	Socioeconomic Score	No. of Units	(2)x(3)				
1	469	13	6,097	114	460	3	1,380
2	207	71	14,697	115	173	29	5,017
3	376	16	6,016	117	433	5	2,165
4	151	38	5,738	118	416	6	2,496
5	86	2	172	119	472	52	24,544
6	452	7	3,164	120	650	1	650
7	684	3	2,052	121	364	34	12,376
8	396	1	396	122	460	33	15,180
10	62	3	186	123	590	9	5,310
11	148	5	740	124	603	7	4,221
12	157	4	628	125	661	1	661
13	261	32	8,352	126	633	23	14,559
14	383	7	2,681	127	571	43	24,553
15	178	9	1,602	128	674	92	62,008
17	10	5	50	129	760	2	1,520
19	143	5	715	134	542	62	33,604
20	406	2	812	135	613	27	16,551
21	546	4	2,184	139	490	106	51,940
22	669	5	3,345	143	506	88	44,528
23	572	1	572	144	546	20	10,900
25	528	15	7,920	146	691	16	11,056
26	177	63	11,151	147	903	1	903
27	389	105	40,845	148	649	16	10,384
28	265	379	100,435	149	795	20	15,900
29	269	74	19,906	150	851	28	23,828
101	509	8	4,072	151	709	8	5,672
102	571	54	30,834	152	631	18	11,358
103	470	51	23,970	154	564	3	1,692
104	646	17	10,982	155	428	2	856
105	462	40	18,480	156	705	7	4,935
106	467	1	467	157	564	1	564
107	366	107	39,162	158	790	3	2,370
108	529	167	88,343	159	620	1	620
109	569	100	56,900	160	715	10	7,150
110	521	11	5,731	161	622	6	3,732
111	651	4	2,604	162	546	1	546
112	639	9	5,751	163	325	2	650
113	409	65	26,585	166	747	1	747
All Census Tracts				2,290 991,483			

Average Socioeconomic Score ... 433

Source: Compiled by author.

Table 13
Section 236: Socioeconomic Scores and
Number of Housing Units by Census Tract

(1) Census Tract	(2) Socioeconomic Score	(3) Number of Housing Units	(2)x(3)
11	148	17	2,516
155	428	304	130,112
143	506	148	74,888
134	542	148	80,216
161	622	201	125,022
104	646	152	98,192
156	705	230	162,150
149	795	<u>186</u>	<u>147,870</u>
All Census Tracts		1,386	820,966
Average Socioeconomic Score	592		

Source: Compiled by author.

Table 14

EHAP Housing: Socioeconomic Scores and
Number of Housing Units by Census Tract

(1)	(2)	(3)					
Census Tract	Socioeconomic Score	No. of Units	(2)x(3)	(1)	(2)	(3)	(2)x(3)
1	469	5	2,345	112	639	3	1,917
2	207	6	1,242	113	409	3	1,227
3	376	1	376	114	460	2	920
4	151	3	453	115	173	7	1,211
5	86	5	430	116	325	3	975
6	452	5	2,260	118	416	7	2,912
7	684	6	4,104	122	460	6	2,760
8	396	3	1,188	123	590	3	1,770
10	62	3	186	124	603	2	1,206
11	148	2	296	125	661	2	1,322
12	157	9	1,413	128	674	2	1,348
13	261	8	2,088	134	542	5	2,710
14	383	5	1,915	145	679	1	679
15	178	4	712	148	649	6	3,894
16	166	2	332	151	709	1	709
17	10	3	30	152	631	5	3,155
18	1	3	3	153	630	1	630
19	143	5	715	154	564	1	564
20	406	3	1,218	155	428	1	428
21	546	9	4,914	156	705	2	1,410
23	572	2	1,144	157	564	7	3,948
25	528	8	4,224	158	790	6	4,740
26	177	6	1,062	160	715	1	715
27	389	23	8,947	161	622	3	1,866
28	265	19	5,035	162	546	1	546
29	269	15	4,035	163	325	6	1,950
104	646	1	646	164	666	3	1,998
107	366	1	366				
108	529	3	1,587				
109	569	5	2,845				
110	521	6	3,126				
All Census Tracts						269	106,744

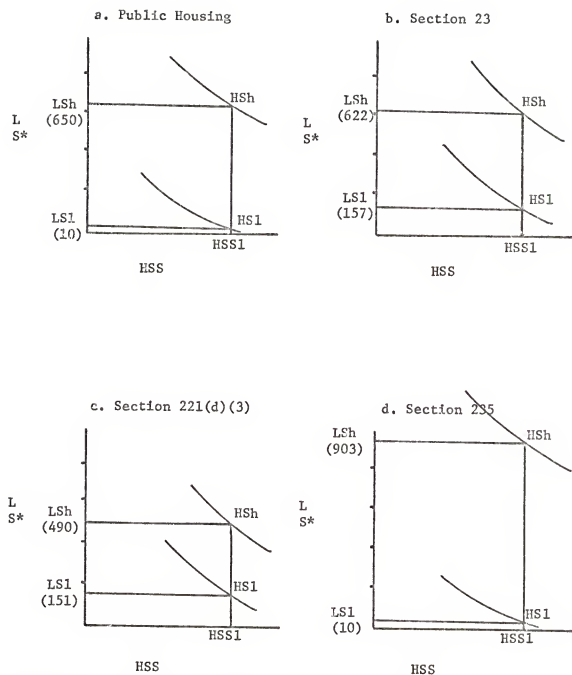
Average Socioeconomic Score ... 397

Source: Compiled by author.

Table 15
 Elderly Housing: Socioeconomic Scores and
 Number of Housing Units by Census Tract

(1) Census Tract	(2) Socioeconomic Score	(3) Number of Housing Units	(2)x(3)
10	62	250	15,500
19	143	331	47,333
4	151	97	14,647
29	269	192	51,648
14	383	197	75,451
8	396	202	79,992
25	528	180	95,040
161	622	204	126,888
160	715	<u>208</u>	<u>148,720</u>
All Census Tracts		1,861	655,219
Average Socioeconomic Score	352		

Source: Compiled by author.



* Measured by highest and lowest socioeconomic score.

Figure 12

Highest and Lowest Locational and Housing Subsidies
Provided by Housing Program

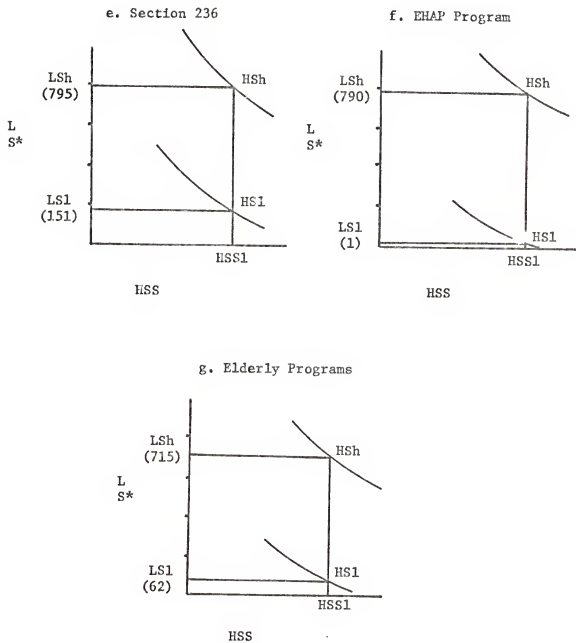


Figure 12 - continued

.2 percent of the Section 235 units are located in the census tract providing that program's lowest locational subsidy. It is particularly important to make a distinction between those housing programs which are located in several census tracts and those programs which are located in many census tracts. Those programs, such as the Section 235 and EHAP programs, which disperse their housing units throughout many census tracts facilitate a more equitable sharing of the social costs and will have a large difference between the lowest and highest locational subsidies they provide. A large difference between the lowest and highest locational subsidies is more of a problem in the other five housing programs in which large housing projects containing many housing units are located in a small number of census tracts.

Summary and Conclusions

The seven housing programs investigated are located in census tracts affording significantly different locational subsidies and housing subsidies. If the housing structure subsidies for each program are comparable, then, on average, a subsidized household's housing subsidy can be significantly affected by the housing program it qualifies for. For example, it is indicated that the average household being subsidized in the Section 236 program in Jacksonville is more likely than the average household in other programs to be located in a census tract with higher per capita income and less poverty, fewer household problems, higher educational achievement and better schools, fewer housing problems and less crime. Conversely, the average public housing household is likely to be located in census tracts in which these conditions are reversed. Unfortunately, the production oriented focus of most research dealing with federal housing programs overlooks the extremely important effects of location.

Locational and housing subsidy differentials within each housing program are, in most cases, quite large. This indicates that it is possible for identical households in the same housing program to be subsidized to considerably different housing subsidy levels.

The locational and housing subsidy differentials between and within programs may be attributed to several factors. The relatively poorer locational performance of the older housing programs, such as public housing and Section 221(d)(3), or certain housing units within each program may be explained by some of the older housing projects having been located inappropriately before federal responsibility regarding location was operative. Some older projects may have initially been located at relatively high elevations on Jacksonville's socioeconomic surface, but urban growth processes may have since eroded these areas to the point where they are now relatively low elevations. Whatever the reasons for these differentials in the locational and housing subsidies between and within programs, the fact remains that a household's housing subsidy can be significantly affected by the housing program it qualifies for and by the location of a particular housing unit within a program.

The relatively low socioeconomic scores of certain census tracts in which subsidized units are located indicate many subsidized households are currently located in census tracts which offer less suitable living environments and are least able to absorb any additional social costs. Although it would be unreasonable to expect HUD to locate all subsidized units in neighborhoods providing identical locational subsidies, the wide differences between the locational and housing

subsidies within programs, primarily those which have units located in only a few census tracts, and between housing programs suggest that HUD is not fulfilling its equal treatment responsibilities outlined in Chapter II.

CHAPTER VI

RACE AND LOCATIONAL SUBSIDIES

In the preceding chapter locational and housing subsidies were found to differ significantly within each housing program and between housing programs. It was demonstrated that, on average, a subsidized household could be provided a significantly higher or lower housing subsidy level depending on the housing program it qualified for and the housing units it occupied within a housing program. It is investigated in this chapter whether the locational and housing subsidy differentials within and between housing programs are related to the racial characteristics of subsidized households. Comparisons are made to determine if white and minority households within each housing program are being located in census tracts offering similar locational and housing subsidies. The analysis also determines if whites are as likely as minorities to occupy those housing programs locating, on average, in higher or lower socioeconomic environments.

Racial-Locational Differences

Table 16 provides the number of white and minority occupied units for each program and the average socioeconomic scores by race for all six housing programs.

Table 16

Number of Housing Units and Average Socioeconomic Scores
for White and Minority Households by Housing Program

Housing Program		No. of Housing Units		Average Socioeconomic Score
Public Housing	White	315		491
	Minority	1,800		233
			Differential	258
Section 23 Leased	White	157		539
	Minority	294		418
			Differential	121
Section 221(d)(3)	White	730		445
	Minority	1,430		297
			Differential	148
Section 236	White	1,180		603
	Minority	206		532
			Differential	71
EHAP	White	160		426
	Minority	109		353
			Differential	73
Elderly	White	1,560		374
	Minority	301		241
			Differential	133
All Six Programs	White	4,102		470
	Minority	4,140		287
			Differential	183

Source: Compiled by author.

Tables 17 through 22 display in greater detail the socioeconomic scores of the census tracts in which white and minority occupied housing units are located and the differences in location between white and minority households for each housing program.*

Table 16 illustrates that, on average, in all six housing programs subsidized white households are consistently located in census tracts with higher socioeconomic scores. The average socioeconomic score differential between white and minority households ranges from a high of 258 points in the public housing program to a low of 71 points in the Section 236 program.

Chi-square tests of independence were performed to test the null hypothesis of no difference between the socioeconomic scores of census tracts in which white and minority occupied units are located in each housing program. Table 23 presents the calculated Chi-square values. The rejection of the null hypothesis is indicated at the .01 level of significance for the five supply-side housing programs. The demand-side EHAP program cannot be rejected at the .01 level; however, it is rejected at the .05 level. This suggests that when compared with the five supply-side housing programs, the EHAP program favors white households but perhaps to a slightly lesser degree. It is clearly indicated that all six housing programs systematically locate subsidized white households in census tracts with significantly higher and, therefore, more favorable socioeconomic environments.

*In Jacksonville, tenant occupancy forms indicated that black households comprised over 98 percent of the subsidized minority households occupying the six housing programs for which racial comparisons were possible. Racial occupancy figures were unavailable for the important Section 235 home ownership program.

Table 17

Public Housing: Socioeconomic Scores and Number of White
and Minority Occupied Housing Units by Census Tract

(1) Census Tract	(2) Socioeconomic Score	(3) White Occupied Units	(2)x(3)	(4) Minority Occupied Units	(2)x(4)
17	10	0	0	645	6,450
13	261	119	31,059	452	117,972
29	269	0	0	270	72,630
14	383	0	0	207	79,281
137	507	4	2,028	6	3,042
159	620	109	67,580	121	75,020
120	650	<u>83</u>	<u>53,950</u>	<u>99</u>	<u>64,350</u>
All Census Tracts		315	154,617	1,800	418,745
Average Socioeconomic Scores		491 (white)		233 (minority)	

Source: Compiled by author.

Table 18

Section 23 Leased Housing: Socioeconomic Scores and Number
of White and Minority Occupied Housing Units by Census Tract

(1) Census Tract	(2) Socioeconomic Score	(3) White Occupied Units	(2)x(3)	(4) Minority Occupied Units	(2)x(4)
12	157	14	2,198	4	628
2	207	0	0	52	10,764
28	265	0	0	75	19,875
1	469	16	7,504	36	16,884
127	571	81	46,251	81	46,251
161	622	<u>46</u>	<u>28,612</u>	<u>46</u>	<u>28,612</u>
All Census Tracts		157	84,565	294	123,014
Average Socioeconomic Scores 539 (white)				418 (minority)	

Source: Compiled by author.

Table 19

Section 221(d)(3): Socioeconomic Scores and Number of White
and Minority Occupied Housing Units by Census Tract

(1) Census Tract	(2) Socioeconomic Score	(3) White Occupied Units	(2)x(3)	(4) Minority Occupied Units	(2)x(4)
4	151	0	0	156	23,556
115	173	0	0	200	34,600
26	177	1	177	175	30,975
28	265	0	0	76	20,140
116	325	0	0	260	84,500
163	325	4	1,300	196	63,700
27	389	69	26,841	3	1,167
20	406	45	18,270	1	406
155	428	156	66,768	44	18,832
6	452	0	0	74	33,448
114	460	0	0	200	92,000
122	460	390	179,400	10	4,600
139	490	<u>65</u>	<u>31,850</u>	<u>35</u>	<u>17,150</u>
All Census Tracts		730	324,606	1,430	425,074
Average Socioeconomic Scores 445 (white)				297 (minority)	

Source: Compiled by author.

Table 20

Section 236: Socioeconomic Scores and Number of White and
Minority Occupied Housing Units by Census Tract

(1) Census Tract	(2) Socioeconomic Score	(3) White Occupied Units	(2)x(3)	(4) Minority Occupied Units	(2)x(4)
11	148	2	296	15	2,220
155	428	263	112,564	41	17,548
143	506	100	50,600	48	24,288
134	542	113	61,246	35	18,970
161	622	170	105,740	31	19,282
104	646	145	93,670	7	4,522
156	705	227	160,035	3	2,115
149	795	<u>160</u>	<u>127,200</u>	<u>26</u>	<u>20,670</u>
All Census Tracts		1,180	711,351	206	109,615
Average Socioeconomic Scores 603 (white)				532 (minority)	

Source: Compiled by author.

Table 21

EHAP Housing: Socioeconomic Scores and Number of White
and Minority Occupied Housing Units by Census Tract

(1) Census Tract	(2) Socioeconomic Score	(3) White Occupied Units	(2)x(3)	(4) Minority Occupied Units	(2)x(4)
1	469	4	1,876	1	469
2	207	6	1,242	0	0
3	376	0	0	1	376
4	151	2	302	1	151
5	86	3	258	2	172
6	452	4	1,808	1	452
7	684	6	4,104	0	0
8	396	3	1,188	0	0
10	62	3	186	0	0
11	148	1	148	1	148
12	157	9	1,413	0	0
13	261	6	1,566	2	522
14	383	2	766	3	1,149
15	178	1	178	3	534
16	166	0	0	2	332
17	10	0	0	3	30
18	1	2	2	1	1
19	143	0	0	5	715
20	406	1	405	2	812
21	546	6	3,276	3	1,638
23	572	2	1,144	0	0
25	528	3	1,584	5	2,640
26	177	3	531	3	531
27	389	14	5,446	9	3,501
28	265	6	1,590	13	3,445
29	269	6	1,614	9	2,421
104	646	1	646	0	0
107	366	0	0	1	366
108	529	0	0	3	1,587
109	569	1	569	4	2,276
110	521	3	1,563	3	1,563
112	639	2	1,278	1	639
113	409	1	409	2	818
114	460	0	0	2	920
115	173	2	346	5	865

Table 21 - continued

(1) Census Tract	(2) Socioeconomic Score	(3) White Occupied Units	(2)x(3)	(4) Minority Occupied Units	(2)x(4)
116	325	0	0	3	975
118	416	4	1,664	3	1,248
122	460	6	2,760	0	0
123	590	3	1,770	0	0
124	603	1	603	1	603
125	661	2	1,322	0	0
128	674	2	1,348	0	0
134	542	5	2,710	0	0
145	679	1	679	0	0
148	649	2	1,298	4	2,596
151	709	1	709	0	0
152	631	3	1,893	2	1,262
153	630	0	0	1	630
154	564	1	564	0	0
155	428	1	428	0	0
156	705	2	1,410	0	0
157	564	6	3,384	1	564
158	790	6	4,740	0	0
160	715	1	715	0	0
161	622	1	622	2	1,244
162	546	1	546	0	0
163	325	5	1,625	1	325
164	666	3	1,998	0	0
All Census Tracts		160	68,224	109	38,520
Average Socioeconomic Scores 426 (white)				353 (minority)	

Source: Compiled by author.

Table 22

Elderly Housing: Socioeconomic Scores and Number of White
and Minority Occupied Housing Units by Census Tract

(1) Census Tract	(2) Socioeconomic Score	(3) White Occupied Units	(2)x(3)	(4) Minority Occupied Units	(2)x(4)
10	62	249	15,438	1	62
19	143	331	47,333	0	0
4	151	0	0	97	14,647
29	269	2	538	190	51,110
14	383	192	73,536	5	1,915
8	396	202	79,992	0	0
25	528	178	93,984	2	1,056
161	622	198	123,156	6	3,732
160	715	<u>208</u>	<u>148,720</u>	<u>0</u>	<u>0</u>
All Census Tracts		1,560	582,697	301	72,522
Average Socioeconomic Scores 374 (white)				241 (minority)	

Source: Compiled by author.

Table 23

Chi-Square Values Comparing White and Minority
Socioeconomic Scores by Housing Program

Housing Program	Calculated Chi-Square Value
Public Housing	413.4*
23 Leased Housing	58.6*
Section 221(d)(3)	820.0*
Section 236	96.8*
EHAP	8.6**
Elderly	219.4*

*Significant at .01 level

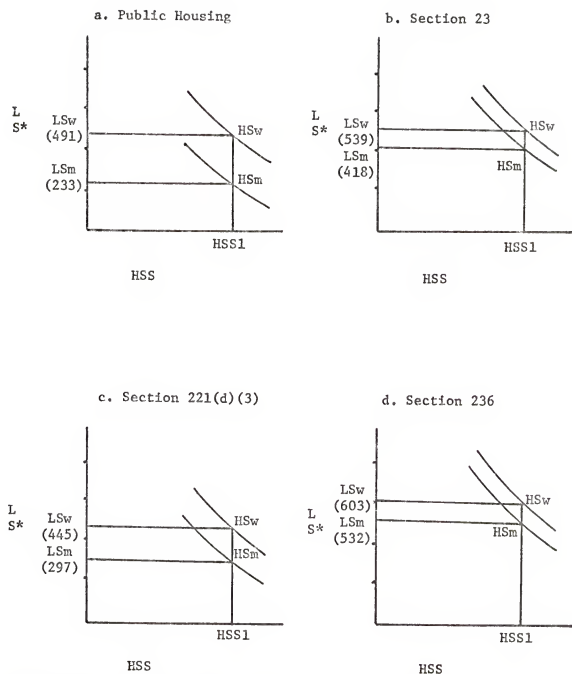
**Significant at .05 level

Note: The first four values were obtained from 2x3 tables and the last two values from 2x4 tables.

Source: Compiled by author.

Following the assumptions provided in Chapter II, it is possible to graph the implications of these different racial patterns in terms of their effect on the housing subsidy. Figure 13 does this for each of the six housing programs and for all six combined. Since it is assumed that for each housing program the housing structure subsidies (HSS_1) provided to both white and minority households are equal, the higher locational subsidies achieved by white households ($LS_w > LS_m$), on average, in each program produce higher housing subsidies for white households than for minority households ($HSS_w > HSS_m$ in every program).

The implications of the spatial injustice to minority households within each housing program are indeed serious. The seriousness of this spatial injustice is compounded when all six housing programs are combined and the average socioeconomic scores of white and minority occupied units compared. The difference of 183 points between the average socioeconomic scores of white and minority households for all six programs is higher than all except the public housing program difference of 258. This indicates that white households, in addition to locating in higher socioeconomic environments in each program, also tend to occupy those federal housing programs locating in more favorable socioeconomic environments. Table 24 indicates that minority households dominate the public housing, Section 221(d)(3), and Section 23 leased housing programs. The first two programs have the lowest average socioeconomic scores (see Table 6) and contain 78 percent of all minority households occupying the six programs investigated. Only 25.5 percent of all white households occupy units operated under these same two programs and Table 16 and Figure 13 indicate that whites in these programs are consistently located in higher socioeconomic

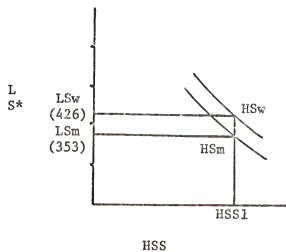


* Measured by average socioeconomic score.

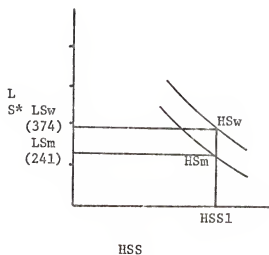
Figure 13

Locational and Housing Subsidies Provided White and Minority Households by Housing Program

e. EHAP Program



f. Elderly Programs



g. All Six Housing Programs

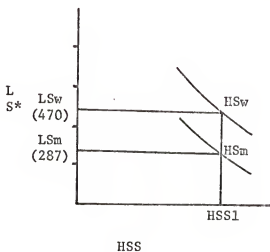


Figure 13 - continued

Table 24

Percentage of White and Minority Occupied Housing Units
by Individual Housing Program and All Housing Programs

Housing Program	For Each Program		For All Programs	
	White	Minority	White	Minority
Public Housing	14.9%	85.1%	7.7%	43.5%
Section 23 Leased	34.8%	65.2%	3.8%	7.1%
Section 221(d)(3)	33.8%	66.2%	17.8%	34.5%
Section 236	85.1%	14.9%	28.8%	5.0%
EHAP	59.5%	40.5%	3.9%	2.6%
Elderly	83.8%	16.2%	38.0%	7.3%
All Six Housing Programs	49.8%	50.2%	100.0%	100.0%

Source: Compiled by author.

environments. Just 5 percent of all subsidized minority households compared with 29 percent of all white households occupy the Section 236 units which are located, on average, in the most favorable socioeconomic environments.

Summary and Conclusions

It has been demonstrated that within each housing program subsidized minority households are located in significantly lower socioeconomic environments than subsidized white households. Minority households, on average, receive lower locational subsidies than whites and, since housing structure subsidies are assumed equal for white and minority households, they also receive lower housing subsidies than whites. Minority households suffer from spatial "double jeopardy" in the sense that not only are they located in poorer locational subsidy areas under each housing program but also they are more likely to be subsidized by those housing programs which are locating in lower socioeconomic environments.

Large locational and housing subsidy differentials within and between housing programs were found in the previous chapter. This led to the conclusion that HUD was not fulfilling its equal treatment responsibility. The findings of this chapter lead to the conclusion that the equal treatment responsibility is being violated along racial lines.

CHAPTER VII
RACIAL CHARACTERISTICS OF CENSUS
TRACTS AND LOCATIONAL SUBSIDIES

It was demonstrated in the previous chapter that subsidized minority households are consistently located in census tracts with lower socioeconomic scores or those tracts providing lower locational subsidies and, therefore, lower housing subsidies than those provided to subsidized white households in each housing program. To this point, no mention has been made of the racial characteristics of census tracts in which subsidized housing units are located. It was deemed appropriate to test the locational subsidy and racial socioeconomic equality issues in the location of subsidized housing units without placing a pejorative connotation on the racial characteristics of census tracts. Therefore, the assumption was made at the outset that minority and white dominated census tracts could yield similar socioeconomic scores based on the twenty variables selected. If minority households had located in census tracts with socioeconomic scores comparable to those in which white households located, the fact that minority households might also be located in minority dominated census tracts would be considered acceptable as far as the racial equality issue of subsidized households is concerned. This, however, is not the case in Jacksonville. In this chapter the important link between residential segregation and socioeconomic inequality is examined.

Locational Subsidy Differences in White
and Black Dominated Census Tracts

In Table 25 the average socioeconomic scores achieved by subsidized minority households locating in census tracts in which in excess of 25 percent of the tract's population is black* are compared with the average scores achieved by minority households locating in census tracts dominated by whites (those tracts containing 75 percent or more white populations). Twenty-one of the ninety census tracts evaluated in this study had black populations which constituted over 25 percent of the tract's total population. These tracts appear in Table 26. Seventeen of these were over 50 percent and nine were over 90 percent black. While these twenty-one census tracts contained 89.2 percent of Jacksonville's 1970 black population, they contained 75.3 percent of the minority households and 20.4 percent of the white households being assisted by the six housing programs for which racial occupancy figures were available. Over 69 percent of the white households were represented in the elderly housing program.

It is clear from Table 25 that census tracts in which blacks comprise in excess of 25 percent of the population provide inferior locational subsidies when compared with white dominated census tracts. The difference in socioeconomic scores in each housing program between black and white dominated census tracts is extremely large, ranging from a low of 177 points in the Section 221(d)(3) program to a high of 368 in the public housing program. Subsidized minority households received their highest average socioeconomic score in the Section 236 program

*Black is substituted for the census term, Negro.

Table 25

Average Socioeconomic Scores Achieved by Subsidized Minority Households Located in Census Tracts 25 Percent or More Black or Less Than 25 Percent Black by Individual Housing Program

Housing Program	Census Tract	Number of Units	Average Socioeconomic Score
Public Housing	25% or more black	1,367	144
	Less than 25% black	433	<u>512</u>
		Differential	368
23 Leased	25% or more black	127	241
	Less than 25% black	167	<u>553</u>
		Differential	312
221(d) (3)	25% or more black	1,266	277
	Less than 25% black	164	<u>454</u>
		Differential	177
Section 236	25% or more black	0	0
	Less than 25% black	206	532
EHAP	25% or more black	69	261
	Less than 25% black	40	<u>512</u>
		Differential	251
Elderly	25% or more black	288	229
	Less than 25% black	13	<u>516</u>
		Differential	287
All Programs	25% or more black	3,117	212
	Less than 25% black	1,023	<u>513</u>
		Differential	301

Source: Compiled by author.

Table 26
Number of Minority Occupied Housing Units by Housing
Program in Census Tracts 25 Percent or More Black

Census Tract	Socioeconomic Score	Percent Black	Public Housing	23 Leased	Section 221(d)(3)	Section 236	EHAP	Elderly	Section 235*
27	389	26.6	0	0	3	0	9	0	105
13	261	29.5	452	0	0	0	2	0	32
163	325	46.4	0	0	196	0	0	0	2
10	62	49.4	0	0	0	0	0	1	3
108	529	54.2	0	0	0	0	3	0	167
26	177	57.8	0	0	175	0	3	0	63
113	409	59.8	0	0	0	0	2	0	65
19	143	64.2	0	0	0	0	5	0	5
5	86	70.3	0	0	0	0	2	0	2
2	207	77.0	0	52	0	0	0	0	71
107	366	87.2	0	0	0	0	1	0	107
115	173	89.6	0	0	200	0	5	0	29
4	151	93.3	0	0	156	0	1	97	38
28	265	98.0	0	75	76	0	13	0	379
18	1	98.4	0	0	0	0	1	0	0
116	325	98.7	0	0	260	0	3	0	0
15	178	99.3	0	0	0	0	3	0	9
114	460	99.7	0	0	200	0	2	0	3
29	269	99.7	270	0	0	0	9	190	74
16	166	99.9	0	0	0	0	2	0	0
17	10	99.9	645	0	0	0	3	0	5
Total			1,367	127	1,266	0	69	288	1,159*
Percent of Minority Households by Housing Program			76	43	89	0	63	96	

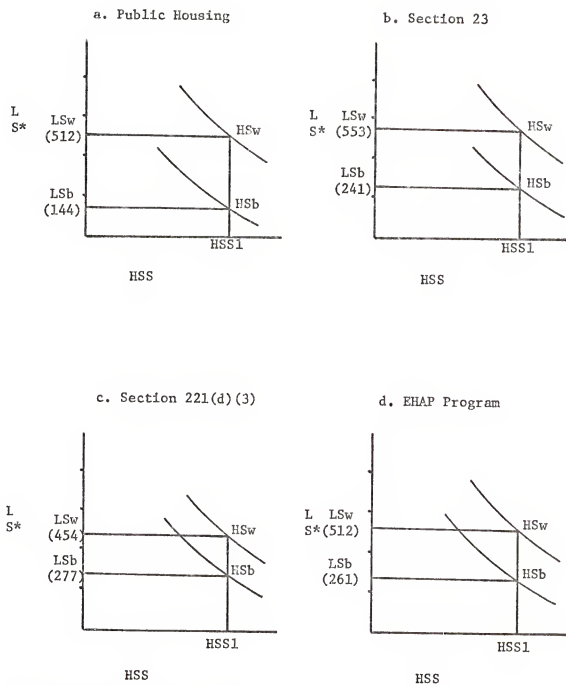
*Race of occupants undetermined.

Source: Compiled by author.

and none of the Section 236 housing units were located in census tracts with black populations in excess of 25 percent of the tract's total population. These findings strongly indicate that black dominated census tracts offer less suitable living environments and are also less able to absorb additional social costs than white dominated census tracts as measured by the twenty variables utilized in this research. The inference is that federal housing programs which follow and/or perpetuate residential segregation provide lower locational subsidies to minority households.

The average housing subsidies realized by minority households under each housing program when they are located in black dominated census tracts (HSb) as opposed to white dominated census tracts (HSw) are depicted in Figure 14. Housing structure subsidies (HSS1) are assumed to be identical in each program. A comparison is not possible for the Section 236 program because all its units are located in predominantly white census tracts.

The implications for a high percentage of minority households and a low percentage of white households located in subsidized housing units in minority dominated census tracts are severe. Whites in such situations not only have to adjust to and pay any social costs deriving from the atypical situation of whites living in a minority dominated area but also they receive lower locational and housing subsidies than other white households being assisted by the same housing program but located in white dominated areas. Minority households may be spared the social costs and personal difficulties accompanying their movement into white dominated areas; unfortunately, they also forego improving the socio-economic environments in which they live.

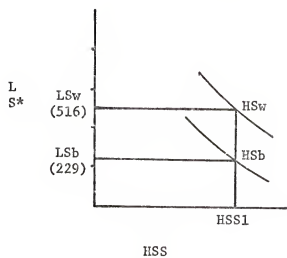


* Measured by average socioeconomic score.

Figure 14

Locational and Housing Subsidies Provided Minority
Households Located in White and Black Dominated
Census Tracts by Housing Program

e. Elderly Programs



f. All Five Housing Programs

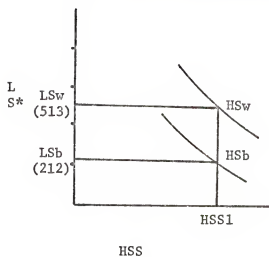


Figure 14 - continued

Implications for Nonsubsidized Households

It is also possible to infer from these data unfavorable trends for nonsubsidized black households. Black dominated census tracts tend to have lower socioeconomic scores than white dominated census tracts and, therefore, are assumed to be less able to absorb any additional social costs generated by the placement of low socioeconomic status households. Sixteen of the twenty-one black dominated census tracts containing 72.6 percent of the 1970 black population had 100 or more subsidized housing units located within their boundaries (this includes white occupied units). This compares with fourteen of the remaining sixty-nine white dominated census tracts and these fourteen tracts contained only 19.4 percent of the 1970 white population. This strongly indicates that any additional social or economic costs generated by the location of subsidized households are more likely to be paid by nonsubsidized black households than by nonsubsidized white households.

Summary and Conclusions

This chapter demonstrates that white dominated census tracts afford substantially higher locational and, therefore, higher housing subsidies than black dominated census tracts. Seventy-five percent of the subsidized minority households compared to 20 percent of subsidized white households are located in census tracts in which blacks comprise in excess of 25 percent of the population. These findings, coupled with the findings of previous chapters, indicate that it will be virtually impossible to maximize locational subsidies and minimize racial-spatial socioeconomic disparities without adopting housing allocation policies which increase residential integration.

Census tracts with a high percentage of blacks are more likely than white dominated census tracts to have subsidized housing units within them. This indicates that nonsubsidized black households are more likely than nonsubsidized whites to be subjected to any social or economic costs generated by the location of subsidized households. Since black dominated census tracts also have lower socioeconomic scores than white dominated census tracts, social costs are not being equitably shared by nonsubsidized black and white households.

CHAPTER VIII

A PROPOSED HOUSING ALLOCATION STRATEGY AND CONCLUSIONS

In the first section of this chapter a housing allocation strategy is proposed. The housing allocation strategy is directed toward alleviating the problems identified in the earlier chapters. In the second section, conclusions concerning the housing subsidy levels, the racial equality achieved through the spatial allocation of subsidized housing units in Jacksonville and the proposed allocation strategy are presented.

A Proposed Housing Allocation Strategy

The demonstrated racial-locational injustice could be alleviated or ameliorated by simply requiring the percentage of subsidized white and minority households in each census tract to be the same as the percentage of white and minority households in each housing program. Such a quota system would be highly artificial and in no way would it insure that census tracts providing higher locational subsidies would be chosen. A meaningful housing allocation strategy must, therefore, attempt to: (1) maximize locational subsidies; (2) minimize racial-locational inequality; and (3) facilitate a fair sharing of social costs by nonsubsidized households. A strategy satisfying these three goals would go a long way toward satisfying criticisms offered by a wide range of federal housing program analysts (Cans, 1968; Kain, 1968; George, 1971; Harvey, 1972a; Downs, 1973a and 1973b; Haar and Iatridis, 1974; Rubinowitz, 1974; Solomon, 1974).

Prior to discussing some key concepts requiring further research and proposing a subsidized housing allocation strategy for Jacksonville, it is necessary to put the findings and the proposed strategy in a more political perspective, since political trends and actions will largely determine whether these problems are recognized and attempts made to rectify them. It is not the intent here to propose a utopian plan with no chance of being implemented; therefore, the prospects for the proposed strategy's success are discussed.

Some geographers contend that the operation of the capitalist system lies at the heart of many contemporary problems, such as the one considered in this research (Harvey, 1972a; Leach, 1974). Although a more critical evaluation of capitalism and models and theories employing its assumptions is generally needed, it is difficult to see how many of the social and spatial injustices could not be alleviated within a capitalist system. Indeed, it might be argued that many of the problems, particularly those related to housing, exist because of deviations from the free competition assumption of capitalism. Philosophical and even polemical debates regarding these identified housing problems are useful but they seldom have an impact on real world problems, problems in which the optimum is seldom attainable and an advocate for a certain position must eventually settle for the best of alternatives even though the motives behind it may not square with his or her philosophical position.

Researchers interested in the distributional aspects of federal housing programs have different approaches to and recommendations for solutions of the problem. Downs (1973b) contends that appealing to the Judeo-Christian ethical values of individuals will do more than any

federal program in alleviating distributional inequities. Downs' enthusiasm for the importance of demonstrating injustices and appealing for just solutions is commendable, yet there are other less idealistic avenues to similar solutions. Downs (1973b), Bergman (1974) and Rubinowitz (1974), as well as others, recognize that powerful economic incentives are probably needed if lower socioeconomic households are to be more spatially dispersed than they are presently.

Additional political difficulties arise when race is considered. Piven and Cloward (1966) subscribe to the belief that pushing for racial integration through federal housing programs will result in strong opposition which will adversely affect the funding of housing programs and thereby housing opportunities for minority households. Yet the current research strongly indicates that pushing for equal socioeconomic opportunity necessarily implies increased residential integration. Piven and Cloward seem to minimize the dangers inherent in a political pragmatism which all too quickly dilutes substance in the interest of "good politics."

What factors offer reasonable hope that a housing allocation strategy aimed at maximizing locational and housing subsidies, minimizing racial-locational inequalities, and more equitably sharing the social costs has a chance of being adopted and implemented? Bergman (1974), Haar and Iatridis (1974), and Rubinowitz (1974) have enumerated the difficulties encountered in locating low income households in higher income suburban areas while, at the same time, citing the increasing likelihood of it coming about. For example, many large companies, having located huge plants in suburban areas, are experiencing high employee absentee and turnover rates because many of their lower wage

earners are unable to obtain housing which they can afford in surrounding suburban areas. Many of these companies are exerting considerable pressure on local governments (which want the companies' tax revenues) to remedy some of their more blatant exclusionary practices.

Recent court cases have expanded the interpretation of the "equal protection clause" of the Fourteenth Amendment of the Constitution, most notably with regard to housing opportunities (George, 1971; Rubinowitz, 1974). Local jurisdictions have been increasingly cited for constitutional violations and have had remedial plans imposed by the courts. As more suburbs face these realities and as more middle class central city neighborhoods undergo the stress of economic and racial integration (facilitated, in some instances, by federal housing programs) while many other middle class suburban areas remain unaffected, it becomes more likely that significant white and black support will emerge for policies which treat similar neighborhoods more equitably. Residents of neighborhoods which have already received subsidized housing units will undoubtedly support policies directed at locating new subsidized units in neighborhoods other than their own. Powerful city politicians can be expected to advocate and support policies which allocate a higher percentage of low income households to the suburbs and which, at the same time, diminish central city welfare roles. The motives inferred above may not be altruistic, in fact, they may be motivated largely by self-interest. They can combine, however, with more idealistic motives to bring about a fundamental change in the allocation of federally subsidized housing units.

Most of the works dealing with federal housing programs have stressed racial segregation instead of the socioeconomic inequality it

tends to perpetuate. If only racial segregation and not also socioeconomic inequality were being perpetuated through federal housing programs, whites and blacks could resist integration in relatively good conscience. If whites and blacks continue to resist integration and a subsidized housing allocation strategy directed at alleviating the demonstrated socioeconomic injustices, they knowingly participate in a social order conducted without integrity. It is unlikely that most whites and blacks will knowingly and overtly condone such a social order. Downs expresses a necessary ingredient beyond self-interest. He states:

I believe the best potential quality of life in our democratic society would require many citizens --especially among the middle-class majority to willingly make significant sacrifices to benefit others out of idealism, altruism, or love--not just self-interest. (Downs, 1973b, p. 182)

Such sacrifices are far more likely if society prompts them and provides a mechanism for insuring fairness.

Before proposing the housing allocation strategy, several key concepts are developed. Ongoing research is needed in these and other areas related to the probable impacts of various housing allocation approaches.

A Minimum Neighborhood Quality

In keeping with the goal of "a suitable living environment" it will be necessary for HUD to require local areas to identify those neighborhoods which do not meet a minimum socioeconomic requirement. In these neighborhoods poor environmental conditions yield poor locational subsidies and nonsubsidized households in these neighborhoods can ill afford any additional social cost which the introduction of subsidized households is likely to generate. Put simply, neighborhoods or census

tracts below a certain socioeconomic score do not meet the "suitable living environment" criteria and, therefore, subsidized housing units should not be located in them.

Carrying Capacity for Neighborhoods

The concept of carrying capacity is not new to geography. It is well known as a concept relating animal grazing potential to environmental support potential. An unstable situation with adverse ecological effects exists when too many animals overgraze a limited space. An analogous situation may exist in urban areas when there is an influx of too many low socioeconomic status households into a formerly healthy, self-sustaining socioeconomic environment. Suitable socioeconomic neighborhoods may be able to accommodate a certain number or percentage and spatial distribution of low socioeconomic status households without experiencing adverse effects. Once a neighborhood's carrying capacity or tipping point has been reached, however, a process of neighborhood decline may ensue, a decline which becomes extremely difficult to abate and very costly to reverse, just as the ecological change or deterioration in the overgrazing case is difficult to reverse.

Extremely low socioeconomic scores for certain census tracts suggest census tracts which may not meet the suitable living environment goal. As census tracts' socioeconomic scores increase, it is assumed that carrying capacity also increases. Census tracts with higher socioeconomic scores and carrying capacities should be able to support a larger number or percentage of subsidized households before experiencing adverse neighborhood effects.

Having advanced two important concepts essential to planning for the spatial allocation of subsidized housing units, the housing allocation strategy is considered. Although various housing allocation plans have been proposed elsewhere (Rubinowitz, 1974, pp. 65-84), most do not specify allocation for smaller geographic areas, such as census tracts, which this research has demonstrated is essential. As stated earlier, this strategy attempts to maximize locational subsidies, minimize racial-locational inequality, and provide for the fair sharing of social costs among nonsubsidized households. The strategy is discussed with reference to the Jacksonville data; however, it is intended to have general applicability to other cities and to be illustrative of a desirable direction for housing allocation policies. Further research is needed to determine if the minimum socioeconomic score and maximum carrying capacity percentages utilized here are high or low.

Step 1

A local agency would be responsible for developing an ongoing monitoring and evaluation procedure, approved by HUD, by which neighborhoods, census tracts, or other smaller geographic areas would be measured as to their relative and absolute socioeconomic quality.

Step 2

The current location of subsidized housing units by housing program and race of occupants should be evaluated to determine if any of the three housing allocation goals are not being fully achieved.

Step 3

Allocation criteria for subsidized units which maximize adherence to the three goals cited above should be developed. Census tracts with socioeconomic scores below some minimum requirement (below 200 in this case) should not be approved as sites for future subsidized housing units. Census tracts with the higher socioeconomic scores would be first choice areas for the location of subsidized housing units, since these tracts provide higher locational and housing subsidies and are assumed to be more able to absorb any additional social costs generated by the location of low income households. In order to minimize racial-locational inequality some flexible quota system may be necessary to insure that minority households are located in census tracts with socioeconomic scores similar to those in which whites are located. To redress existing racial-locational socioeconomic inequality it might be necessary to give minority households preferential treatment (if legal) by allowing them first choice at housing units which become vacant in those census tracts with the higher socioeconomic scores.

The effectiveness of any housing allocation strategy rests on the assurance that census tracts with similar socioeconomic scores will receive similar treatment. It will be necessary to research and establish a maximum number or percentage of subsidized housing units which can be introduced into any census tract. Since the socioeconomic carrying capacities for census tracts vary, the maximum number and percentage of units should fluctuate with a tract's socioeconomic score. Once a census tract has received subsidized housing units, it should not be considered again for the placement of additional units until other census tracts with higher socioeconomic scores have received subsidized housing units.

Table 27 presents a hypothetical subsidized housing allocation strategy for Jacksonville with the ninety census tracts representing the smaller geographic areas. Socioeconomic scores from 1 to 1,000 indicate census tracts ranging from least suitable to most suitable socioeconomic environments and, therefore, from smaller to larger carrying capacities.

Since the socioeconomic characteristics of individual households affect a census tract's socioeconomic score, the introduction of low socioeconomic status households into census tracts will tend to decrease the relative and absolute socioeconomic scores of these census tracts, unless other growth trends offset it. If lower socioeconomic status households are spatially allocated to higher socioeconomic status census tracts instead of to lower socioeconomic census tracts which has been the historical trend, it can be anticipated that lower socioeconomic status census tracts will improve their relative and absolute socioeconomic standing, since the pressure of additional low income households in these tracts will be diminished. Over time the relative and absolute socioeconomic differences between census tracts with lower and higher socioeconomic scores should diminish, if such a locational strategy is adopted and implemented. Figure 15 depicts the expected shift in census tract socioeconomic scores. Such an allocation strategy provides for the "spatial deconcentration of housing opportunities for persons of lower income" which is an objective of the 1974 Housing and Community Development Act.

Conclusions

The employment of principal components analysis and a variance weighted component score technique to derive a socioeconomic score surface

Table 27

Proposed Allocation of 1,000 Subsidized Housing Units in Jacksonville, Florida

Number of Subsidized Units	Socioeconomic Score Category	Number of Census Tracts	Description
0	1 to 200	12	No new subsidized housing units are to be located in these census tracts.
50	201 to 400	12	Not suitable for units serving lowest income households or large housing projects; suitable for moderate income households; subsidized housing units should not constitute more than 2 percent to 5 percent of all housing units in a tract.*
350	401 to 600	32	Suitable for any housing program; subsidized housing units should not constitute more than 6 percent to 9 percent of all housing units in a tract.*
450	601 to 800	30	Suitable for any housing program; subsidized housing units should not constitute more than 10 percent to 13 percent of all housing units in a tract.*
150	801 to 1,000	4	Suitable for any housing program; subsidized housing units should not constitute more than 14 percent to 17 percent of all housing units in a tract.*

*For census tracts with socioeconomic scores of 201 to 250 it is assumed that subsidized housing units should not exceed 2 percent of all housing units in the tract. An additional 1 percent is assumed for each increase of 50 points in a tract's socioeconomic score.

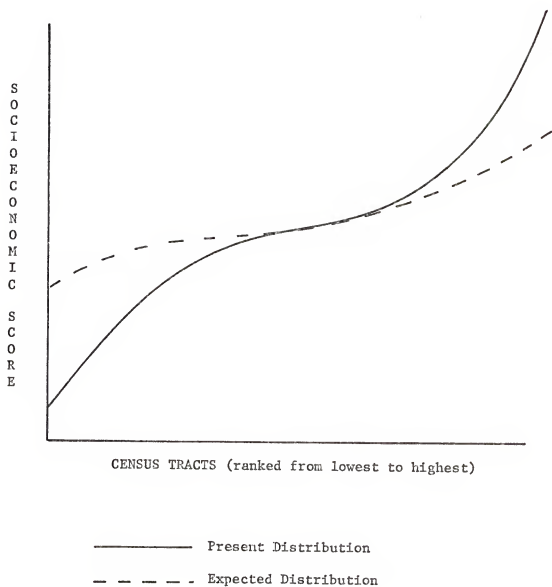


Figure 15

Expected Shift in Socioeconomic Scores of Census Tracts
if Proposed Housing Allocation Is Adopted

for Jacksonville appears justified. Index scores indicating the relative socioeconomic suitability of the ninety census tracts were produced. The assumption was made that, ceteris paribus, census tracts with higher socioeconomic scores provided greater locational subsidies. Since it was also assumed that each housing program provided identical housing structure subsidies, subsidized households locating in census tracts providing higher locational subsidies also received higher housing subsidies.

Seven housing programs were compared under these assumptions and it was found that the housing units in each program were located in census tracts offering significantly different locational and housing subsidies. Additionally, it has been demonstrated that housing subsidy levels within each housing program fluctuated considerably depending on the location of a particular housing unit. It is concluded, therefore, that, on average, a subsidized household's housing subsidy is significantly affected by the housing program it qualifies for and the particular housing unit it occupies within a housing program. The low socioeconomic scores of some census tracts in which certain subsidized housing units were located indicate that housing subsidies could be improved considerably by housing units being located in census tracts with higher socioeconomic scores. The substantial housing subsidy differentials stemming from location between and within housing programs suggest that HUD has not been fulfilling its responsibility of providing equal treatment.

For the six housing programs for which the location of white and minority occupied housing units were compared, the null hypothesis of no difference between white and minority occupied units and the socio-

economic scores of the census tracts in which they located was rejected for all of the six programs. Subsidized minority households were located in census tracts with significantly lower socioeconomic scores. Therefore, subsidized minority households received lower locational and housing subsidies than subsidized white households in the same housing program. The racial-locational socioeconomic inequality was further exacerbated by the fact that minority households also tended to dominate those housing programs, public housing and Section 221(d)(3), which, on average, located in census tracts providing lower locational subsidies. These findings suggest that HUD is not achieving its responsibility of insuring equal racial treatment in the operation of its housing programs.

This research has provided a limited yet useful comparison of six supply-side and one demand-side housing programs. Although the demand-side EHAP program, on average, achieved higher locational subsidies than the public housing, Section 221(d)(3), and elderly programs, it achieved lower locational subsidies than the Section 23 leased housing, Section 235 and Section 236 housing programs. In terms of socioeconomic inequality based on race, the EHAP program significantly favored white over minority households but apparently to a slightly lesser extent than the five supply-side programs with which it was compared. One strength of the EHAP program appears to be its ability to disperse subsidized households more evenly throughout the city of Jacksonville. The EHAP program housing units represented slightly more than 2 percent of all the subsidized housing units considered. Further analysis of the EHAP program and comparisons with various supply-side programs are needed, since the 1974 Housing and Community

Development Act schedules the Section 8 program to eventually replace all existing non-rural, low income housing programs. The Section 8 program is similar to the EHAP program in many respects.

The racial characteristics of census tracts were not considered in deriving their socioeconomic scores. It was demonstrated, however, that minority households in each housing program received much higher locational and housing subsidies when they were located in census tracts occupied primarily by whites as opposed to blacks. The inference from this finding is that socioeconomic inequality necessarily accompanies housing programs which perpetuate residential segregation. It is concluded that it is not the residential segregation, per se, but rather the socioeconomic inequality it perpetuates which is the more significant problem. It would appear that it will be necessary for future low income housing programs to involve greater residential integration, if the identified problems are to be ameliorated.

The findings also permit several conclusions concerning nonsubsidized households. It was indicated that black dominated census tracts containing 70 percent of the 1970 black population had 100 or more subsidized units located within them while only 20 percent of the white 1970 population resided in white dominated census tracts which contained 100 or more subsidized units. Following the social cost results assumed earlier, it would appear that nonsubsidized black households have been paying a greater share of the social costs generated by the placement of low income housing units. This is an unfortunate trend, since the lower socioeconomic scores of predominantly black census tracts suggest that these tracts are less able than most predominantly white tracts to absorb additional social costs. This process, if continued, will undoubtedly speed neighborhood decline in black residential areas.

In light of the assumptions guiding this research, it is concluded that the current implementation of federally subsidized housing programs in Jacksonville is perpetuating socioeconomic inequality for both subsidized and nonsubsidized minority households. This socioeconomic inequality is based on race and manifest in space. It has been demonstrated that subsidized white households receive larger housing subsidies and nonsubsidized white households are more likely to escape the social costs generated by the placement of subsidized housing units.

Projecting conditions which prevail in one urban center to other urban centers requires caution. There is little evidence, however, in the existing literature to suggest that Jacksonville represents an atypical case study with respect to federal housing programs. On the contrary, it is indeed probable that similar studies conducted in other American cities would reveal similar housing program and racial-locational inequities.

It must be concluded that the operation of federally subsidized housing programs at the local level results in socioeconomic inequality based on race and accomplished through the different location patterns of white and minority occupied housing units. The processes which give rise to the observed patterns have not been investigated. Although investigation and knowledge of the processes and motives behind them are important, this research has been more concerned with the socioeconomic impact of existing and future subsidized housing location patterns. It is relatively unimportant whether the processes which give rise to these unequal racial-locational patterns are intentional or accidental, since the unfavorable effects on minority households, both subsidized and nonsubsidized, are the same. Clearly, HUD's

responsibility for insuring equal opportunity and racial equality in the operation of its housing programs applies regardless of the processes involved. HUD's responsibility would seem to involve altering the processes, intentional or otherwise, which have given rise to these unequal patterns. It is, therefore, imperative to do something about the racial-spatial injustices demonstrated here. Obviously, solutions to these problems require an explicit consideration of racial and spatial variables. A geographer is particularly well suited to analyze the spatial variable.

The proposed housing allocation strategy has directed its emphasis toward: (1) maximizing the locational subsidy; (2) minimizing racial-locational socioeconomic inequality; and (3) equitably sharing the social costs of housing programs by nonsubsidized households. There are, however, other important concerns which the proposed strategy does not address. Although accessibility to favorable socioeconomic environments has been the prime concern, accessibility to other important factors, such as jobs and adequate transportation, have not been considered. Indeed, there may be census tracts with high socioeconomic scores which, due to inaccessibility, may constitute relatively poor locations for subsidized housing units. The issue of selecting a specific site within a larger area has not been considered. Some allocation strategy is also needed at this level (current guidelines, such as HUD's Project Selection Criteria, may be adequate at this level).

Despite the fact that some important variables related to the location of housing programs have not been adequately covered, this research has identified problems and outlined solutions to problems

which are extremely important but which have, heretofore, received insufficient attention and research. The placement of the low income housing allocation problem within a welfare geography framework has presented but one problem in which the spatial allocation of society's benefits and costs should be investigated. The proposed housing allocation strategy would appear to complement steps which might be taken to alleviate other urban problems strongly related to residential patterns. Problems, such as the increasing fiscal decline of central cities, restriction of minority population largely within central cities, and unequal provision of educational opportunities, might well be lessened by adherence to such an allocation strategy.

APPENDIX A

EQUATIONS FOR DERIVING SOCIOECONOMIC SCORES AND INDEX SCORES USING VARIANCE WEIGHTED METHOD

Socioeconomic Score

$$SS_t = \sqrt{e_1} \cdot CS_{1t} + \sqrt{e_2} \cdot CS_{2t} + \sqrt{e_3} \cdot CS_{3t} \quad (1)$$

t = census tract t

SS_t = socioeconomic score for census tract t

$\sqrt{e_1}$ = square root of the first component's eigenvalue

$\sqrt{e_2}$ = square root of the second component's eigenvalue

$\sqrt{e_3}$ = square root of the third component's eigenvalue

CS_{1t} = census tract t's component score on the first component

CS_{2t} = census tract t's component score on the second component

CS_{3t} = census tract t's component score on the third component

Index Score

$$SS_h - SS_l = SS_r$$

SS_h = socioeconomic score for the highest tract

SS_l = socioeconomic score for the lowest tract (negative number)

SS_r = socioeconomic score range

Given: SS_h = 1000 and SS_l = 1

$$\frac{SS_t - SS_l}{SS_r} \times 1000 = ISS_t \quad (2)$$

ISS_t = index socioeconomic score for census tract t

Table A-1

Composite Scores Derived from Component Scores
Using Unweighted and Variance Weighted Methods

Census Tract	Component I	Component II	Component III	Composite Score
Unweighted Component Score Method				
1	(1.000 + .500 + -1.000)	x 1,000	500	
2	(.500 + -1.000 + 1.000)	x 1,000	500	
3	(-1.000 + 1.000 + .500)	x 1,000	500	
Weighted Component Score Method*				
1	(1.384 + .575 + -1.000)	x 1,000	959	
2	(.684 + -1.151 + 1.000)	x 1,000	531	
3	(-1.384 + 1.151 + .500)	x 1,000	267	

*Weighted by the square root of the component's eigenvalue. The eigenvalues for I equals 1.384, for II equals 1.151 and for III equals 1.000.

Source: Compiled by author.

APPENDIX B

Table B-1

TRANSFORMATIONS REQUIRED TO NORMALIZE ORIGINAL TWENTY VARIABLES

Variables	Transformation Performed	Normal Distribution
Household:		
1. Units owner-occupied (%)	--*	No
2. Female-headed households (%)	Log	Yes
3. Households divorced or separated of those married (%)	Log	Yes
4. Occupied units without automobile (%)	Log	Yes
Economic:		
5. Mean family income/average number of persons per household	None	Yes
6. Labor force unemployed (%)	None	Yes
7. Population below poverty level (%)	Log	Yes
8. Median home value	None	Yes
9. Median gross rent	None	Yes
Housing:		
10. Units lacking plumbing (%)	Log	Yes
11. Units with plumbing but 1.01 more persons per room (%)	None	Yes
12. Rental units for which households pay in excess of 25 percent of income (%)	Log	Yes
13. Units with air conditioning (%)	None	Yes
Education:		
14. High school graduates (% over 25 years old)	None	Yes
15. Persons 16-21 years old not in high school or enrolled (%)	None	Yes
16. Composite sixth grade test scores	None	Yes
Crime:		
17. Part I crime rate per 100,000 population	Log-Log	Yes
18. Part II crime rate per 100,000 population	Log	Yes
19. Violent crime rate per 100,000 population	Log	Yes
Health:		
20. Age-adjusted death rate	None	Yes

*The attempted transformations did not achieve a normal distribution.

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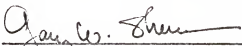
BIOGRAPHICAL SKETCH

John Garvis Patterson was born on April 7, 1944 in Indianapolis, Indiana. Six months later his family moved to Lexington, Kentucky. When he was eight, the family moved to Chicago, where they resided, except for a year in Ogden, Utah and another in Montclair, New Jersey, from 1952 to 1970. John graduated from Mt. Carmel High School in Chicago in 1962 and attended De Paul University in the same city. He majored in geography and received the Bachelor of Arts in 1966.

John was commissioned a second lieutenant and assigned to the Military Intelligence Branch of the Army. He had tours of duty in Ft. Benning, Georgia; Ft. Holabird, Maryland; and Ft. Hood, Texas before serving a year in Vietnam.

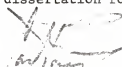
He entered the University of Maryland in 1969. While at Maryland he married Marie Bernice Rooney of Chicago and daughter, Christina Marie, was born. John taught geography courses in Maryland's University College and received the Master of Arts in geography in 1972. He entered the University of Florida the same year to work toward a Doctor of Philosophy in geography. He has held teaching and research assistantships in the Department of Geography and the Urban and Regional Development Center.

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.




Gary W. Shannon, Chairman
Associate Professor of Geography

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.




Carl Feiss
Professor of Architecture

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.



Virginia R. Hetrick
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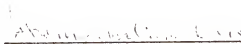
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This dissertation was submitted to the Graduate Faculty of the Department of Geography in the College of Arts and Sciences and to the Graduate Council, and was accepted as partial fulfillment of the requirements for the degree of Doctor of Philosophy.

August, 1975

Dean, Graduate School

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.


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